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FLORA OF THE LESSER ANTILLES

Leeward and Windward Islands

BY

RICHARD A. HOWARD

ARNOLD ARBORETUM
HARVARD UNIVERSITY

VOLUME 3

MONOCOTYLEDONEAE

with the collaboration of

Frank W. Gould – Poaceae

Tetsuo Koyama – Cyperaceae

Paul J. M. Maas – Burmanniaceae, Cannaceae, Zingiberaceae

Robert W. Read – Palmae

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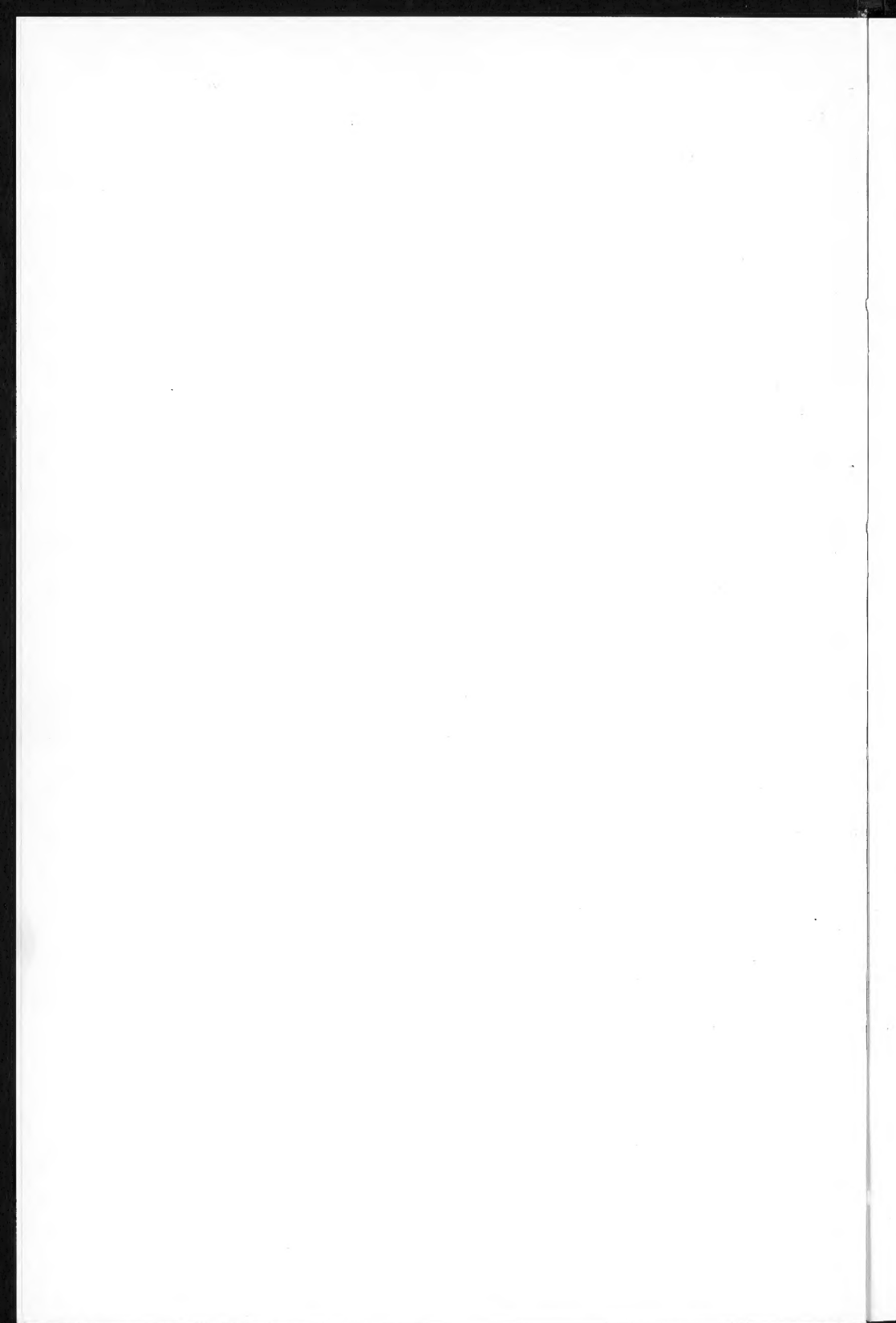
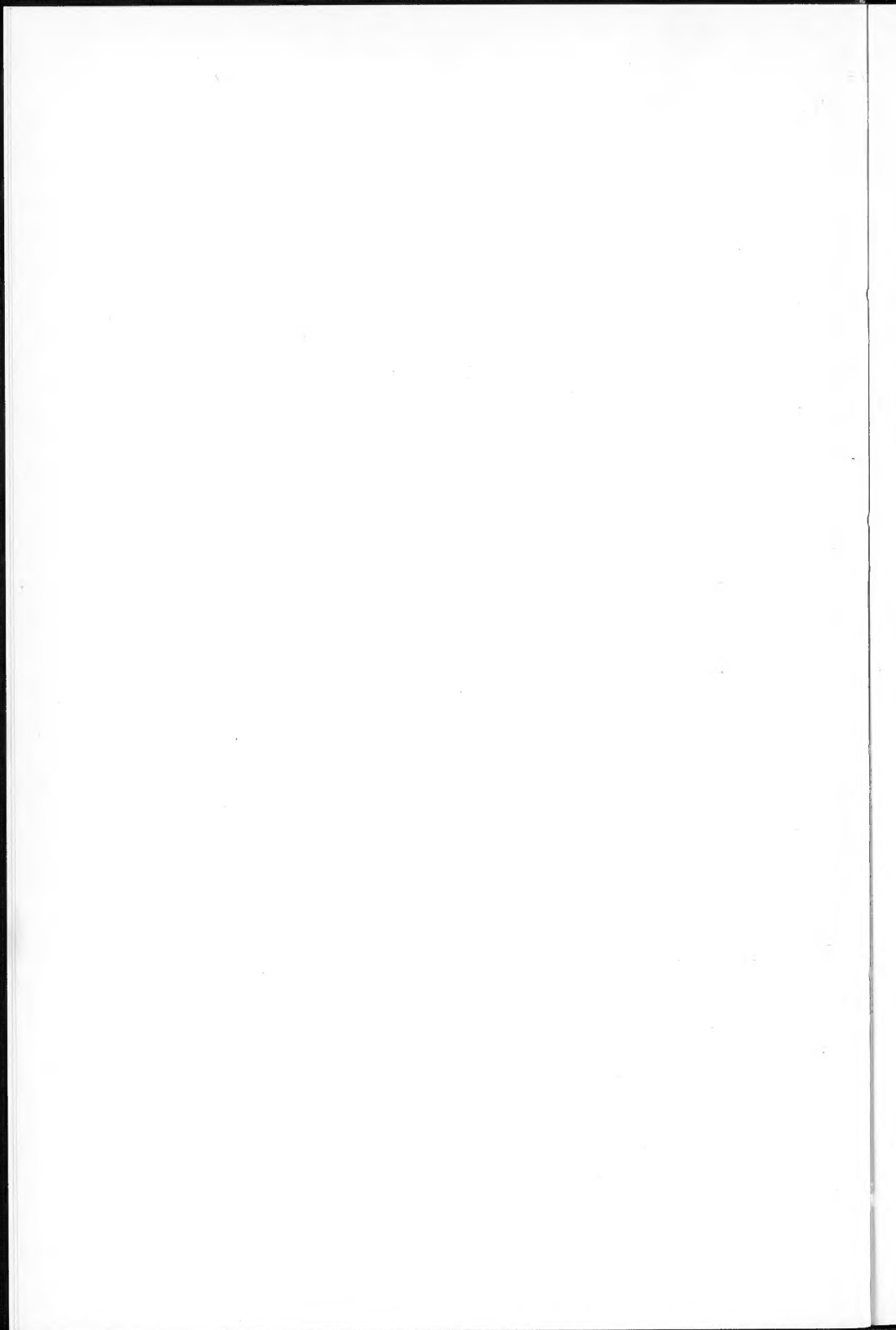


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INTRODUCTION

A flora of the Lesser Antilles offers a particular challenge, for no single flora has ever been written for the archipelago. The Lesser Antilles comprise thirty-seven major islands and perhaps a hundred or more minor islands. They vary in size and altitude as well as in the number of ecological zones, and the vegetation is diverse beyond what might be expected in small, tropically located land masses. The affinities of the plants are sought in the Greater Antilles, Central America and northern South America. Taxa once thought to be endemic or geographically isolated in the Lesser Antilles are now known to occur in other areas. Recent work in the *Flora Neotropica* series of publications has shown the correct relationships and the correct nomenclature for plants of the Lesser Antilles, and additional changes will be made as more monographs for the tropics are completed.

Botanical records for the Lesser Antilles date from the voyages of Columbus, but the first specimens were assembled only in the latter part of the seventeenth century from the travels of Sir Hans Sloane (1687), Charles Plumier (1689) and James Reed (1692). A few of these collections are cited by Linnaeus in his *Species Plantarum*, and a few of the Lesser Antillean islands are mentioned by name.

For slightly more than the last century, floristic work on the Lesser Antilles has involved individual or politically grouped islands. As Grisebach's *Flora of the British West Indies* considered, with very few exceptions, only the islands of the British Commonwealth, so subsequently have the works on French, Dutch and Swedish islands had only a national interest. As a result, the specimens mentioned in these publications, of historical as well as recent collections, are widely scattered in herbaria of Europe. An attempt is made in this flora to account for all of the names used in the primary floristic publications included in the bibliography. Additional references are given in the text.

As no publication of this type is completely original or can be based only on the specimens seen, I am indebted to past and present authors whose works have been consulted and often incorporated deliberately or inadvertently in this publication.

SEQUENCE OF FAMILIES OF THE MONOCOTYLEDONEAE

Typhaceae	Juncaceae
Pandanaceae	Liliaceae
Potamogetonaceae	Hypoxidaceae
Ruppiaceae	Smilacaceae
Cymodoceaceae	Haemodoraceae
Najadaceae	Amarylloidaceae

Alismataceae	Agavaceae
Limnocharitaceae	Dioscoreaceae
Hydrocharitaceae	Iridaceae
Poaceae	Musaceae
Cyperaceae	Heliconiaceae
Palmae	Strelitziaceae
Cyclanthaceae	Zingiberaceae
Araceae	Cannaceae
Lemnaceae	Marantaceae
Bromeliaceae	Burmanniaceae
Commelinaceae	Orchidaceae*
Pontederiaceae	

The classical arrangement of families known as the Englerian system has been followed, with some segregated families recognized. Keys are supplied to genera within families and to species within genera. Varieties and formae are listed in synonymy for reference purposes for those who wish to subdivide further polymorphic species. The general synonymy given includes the basionym, binomials used in other floras of the area and taxa typified by specimens from the Lesser Antilles. An attempt has been made to check original descriptions and publications and to verify references and the citation of authors of new combinations. This has often resulted in the use of names of authors which differ from those given in other floras but which are justified on the basis of priority.

Some introduced and cultivated plants have been included in this flora, in lists or within keys, or with descriptions. Those included have escaped from cultivation, and are established as part of the natural vegetation or are conspicuous in current cultivation. The record is not complete for all cultivated ornamentals, or vegetables and crop plants, since few are represented by herbarium specimens which would permit an accurate determination. An inventory of the first botanical garden in the Lesser Antilles, founded on St. Vincent in 1765, was published by Rev. Lansdown Guilding in 1825. One can only assume that the plants were identified accurately at the time. Only a small percentage of the taxa are currently under cultivation and it is difficult to establish correct names today. The botanical garden at St. Pierre, Martinique, was destroyed in the eruption of Mt. Pelée in 1902. A list of the plants once introduced and cultivated there was published previously, and specimens from that garden, collected by Belanger, Hahn, Plée and others, are in the herbarium in Paris. Many of these taxa are still cultivated in the French islands, but others did not survive the holocaust. Two species of *Pandanus* described from cultivated plants in the botanical garden of St. Pierre are included in this text in the hope that this hardy genus may still be found in some other location on the island.

A key to all families of the Lesser Antilles, which will be included as an

* Published in 1974 as volume 1 of the *Flora of the Lesser Antilles*.

appendix to the complete flora in the last volume, will be made available as a separate publication for student use.

It is intended, as far as is possible, to cite not only the type locality but the collector, the specimen by number and the location of the holotype. Occasionally lectotypes are designated, but this is more appropriately the task of a monographer, who can assemble specimens from many herbaria for direct comparison and for the selection of a lectotype or neotype as required. The typification of Linnaean species is not attempted. This is a difficult and complex problem for nearly every species Linnaeus described, and the lack of this information for floristic work is deplored. Many of the early collectors in the Lesser Antilles did not use serial numbers for their specimens. Although they may have collected and distributed duplicate specimens, there are continual problems, first in locating the specimen and then in associating descriptions and unnumbered collections. Two major problems in work on the Caribbean flora are the paucity of specimens collected by Jacquin and the lack of reproduction of the frequently cited manuscripts of Plumier. The collections of Duss also present a special problem. Apparently, in the preparation of duplicates for distribution, collections made in several areas on either Guadeloupe or Martinique, or on both, were combined, and a label may record several numbers and several locations. Although Urban and other workers have attached suffix letters to a number, the original collection may no longer be available in Berlin due to the loss, during World War II, of major portions of the general herbarium as well as the personal herbaria of Krug and Urban.

The data given for general distribution of a taxon have been compiled from herbaria and published records. For distribution within the Lesser Antilles, a north to south arrangement is used as follows:

Anguilla	Guadeloupe
St. Martin	La Désirade
St. Barthélemy (St. Barts)	Marie Galante
Barbuda	Les Saintes
Antigua	Dominica
Saba	Martinique
St. Eustatius	St. Lucia
St. Kitts (St. Christopher)	St. Vincent
Nevis	The Grenadines
Redonda	Grenada
Montserrat	Barbados

When a validating herbarium specimen from an island has been examined, this is recorded with an exclamation mark (!) following the name of the island. Island records obtained from floras or descriptive work which are not verified with actual specimens are cited without the exclamation mark. Britton, in many of his publications, listed general distribution in the Lesser Antilles as, for example, "Saba to Grenada." Véléz listed each

island in his publication *Herbaceous Angiosperms of the Lesser Antilles*, crediting Britton ("B") for each island between Saba and Grenada. Vélez also recorded his own collections and his "sight records." Regrettably, Vélez's specimens were not widely distributed, and after his death his personal collections were neglected and have been almost completely destroyed by insects.

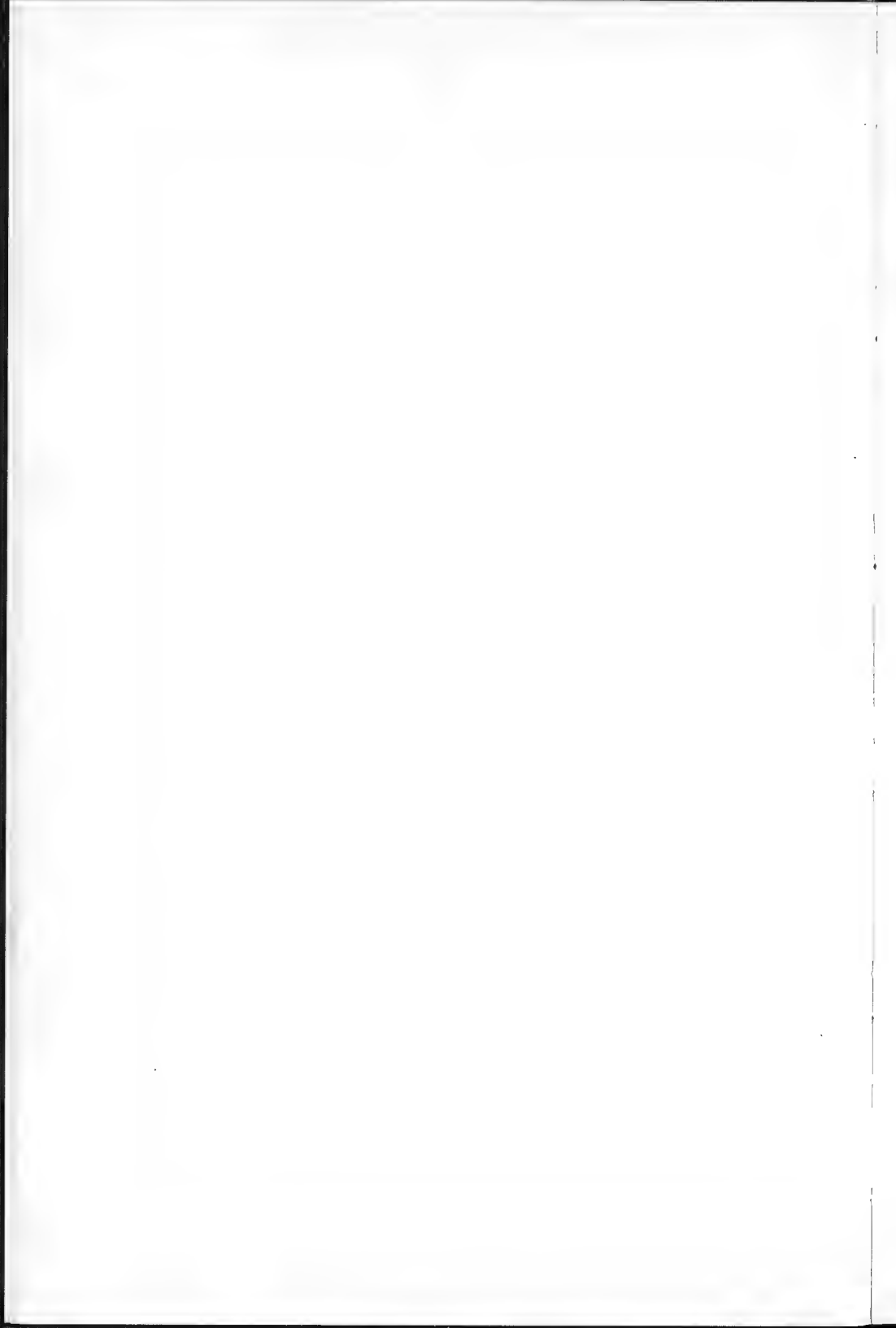
ACKNOWLEDGMENTS

I am grateful to my colleague and field companion, Dr. George R. Proctor, not only for his contribution of the *Pteridophyta* as volume two of the *Flora of the Lesser Antilles*, but for his months of field work in the Lesser Antilles which made high-quality specimens available for study. His field work, and much of my own, was supported by a grant from the National Science Foundation. Two grants from the American Philosophical Society permitted survey work some years ago and, more recently, short trips to investigate particular problems. The results of these trips are incorporated in this volume and will be evidenced in subsequent volumes. A Fellowship, awarded by the John Simon Guggenheim Memorial Foundation, has enabled me to complete the final manuscript compilation.

This research has involved periods of study in various herbaria in the United States and in Europe. I appreciate the facilities offered at each institution, and am particularly grateful to the director and staff of The New York Botanical Garden for the kindnesses extended to me over a five-month period of residence.

The contribution of systematic treatments by the following specialists is acknowledged with thanks: Dr. Frank W. Gould—Poaceae, Dr. Tetsuo Koyama—Cyperaceae (treatment based on studies supported by National Science Foundation Grant GB-32098, principal investigator, T. Koyama), Dr. Paul J. M. Maas—Burmanniaceae, Cannaceae, Zingiberaceae, and Dr. Robert W. Read—Palmae. The most sincere words of appreciation, however, are extended to my wife, Elizabeth Solie Howard, who has not only been understanding but has efficiently typed the original manuscript, and to Ms. Brooke Thompson-Mills, who has labored long and capably in editing this volume.

I should like to express my gratitude also to the Trustees of the Charles E. Merrill Trust, whose grant to the Arnold Arboretum has provided assistance in the publication of this volume.



TYPHACEAE

TYPHACEAE A. L. Jussieu, Gen. 25. 1789.

Marsh or aquatic herbs; rhizomes creeping, stems erect. Leaves alternate, linear, sheathing at the base, flat or plano-convex. Inflorescence monoecious, the staminate and pistillate flowers interspersed with sterile ones. Flowers densely crowded in spikelike racemes subtended by fugaceous bracts; staminate flowers above the pistillate, separate or contiguous, with a perianth of bristles, stamens 1-7, with filaments free or connate; pistillate flowers with a bristlelike perianth, ovary 1-celled, the style elongate, the stigma linear. Fruit a linear, single-seeded achene.

TYPE GENUS: *Typha* Linnaeus.

The family consists of a single genus with ten species distributed throughout temperate and tropical marshy and wetland areas.

TYPHA Linnaeus

Typha L., Sp. Pl. 2: 971. 1753.

Characters of the family.

TYPE SPECIES: *Typha latifolia* Linnaeus.

Typha domingensis Pers., Syn. Pl. 2: 532. 1807.

Type locality: St. Domingo.

Plant of marshes, stems 2.5-4.0 m. tall. Leaves 10 or more, linear, flat, to 2.5 m. long and 1.5 cm. wide. Inflorescence exceeding the leaves; staminate portion of inflorescence 20-35 cm. long, slightly separated from the brown, pistillate portion, with clavellate hairs subtending the flowers and fruit.

GENERAL DISTRIBUTION: Mexico, Central America, Greater Antilles, South America.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe.

OBSERVATIONS: This plant was reported by Britton (Sci. Surv. Porto Rico 5(1): 9. 1923) as occurring from "Cuba to Trinidad." Véléz (Herb. Angiosperms 114. 1957) indicated "collections by the writer" from Antigua, St. Kitts and Martinique; Stehlé reported the plant from Guadeloupe. Fournet (Fl. Guadeloupe Martinique 409. 1978) indicated that no locality was known. No herbarium collections from the Lesser Antilles have been seen, and deliberate searches on many islands by several collectors and correspondents have not been successful.

PANDANACEAE

PANDANACEAE R. Brown, Prodr. 340. 1810.

Trees or shrubs of distinctive form, sometimes scandent, commonly producing basal adventitious "prop" roots. Leaves clustered at the apex of the stem or branches, lanceolate or linear, sessile and sheathing at the base, spirally arranged, usually spiny-margined and with spines on the abaxial surface of the midrib. Plants dioecious, the staminate inflorescences compound, paniculate with branches spicate, the pistillate inflorescences short, racemose or capitate, bracteate. Staminate flowers without a perianth, the stamens few to many, with filaments elongate, seemingly branched; pistillate flowers with pistils racemose or capitate, aggregated, the clusters or phalanges 1- to many-celled, with ovules solitary, the styles usually wanting. Fruit drupaceous, fibrous or woody.

TYPE GENUS: *Pandanus* Linnaeus f.

An Old World family of three genera and about 700 species. Most are tropical seacoast or marsh species, with a few present in warm-temperate climates as well.

PANDANUS Linnaeus f.

Pandanus L. f., Suppl. 64. 1781.

Shrubs or trees of distinctive form; stems erect, simple or branched, with prominent stout adventitious "prop" roots. Leaves mostly terminal, densely spirally arranged, sessile, broadly lanceolate or linear, the margin and midrib with spines. Plants dioecious, the staminate inflorescence paniculate with spikelike branches, the stamens numerous, racemose or umbellate; pistillate inflorescence of capitate clusters of aggregated carpels. Fruits of large "heads" comprising an aggregation of syncarps (phalanges), their tops flat, concave or convex or tubercled, each apex crowned by a woody stigmatic area, fibrous and fleshy at the base or woody throughout; seeds variously placed.

TYPE SPECIES: *Pandanus odoratissimus* L. f.

A genus of 600 species native to the Old World tropics.

OBSERVATIONS: There is no satisfactory treatment nor consensus regarding the introduced, cultivated or persisting species of the Lesser Antilles or the names to be applied. Almost no herbarium material is available of plants from the area, and none of the present collections could be considered a complete or even reasonable specimen.

"*Pandanus pacificus* Hort." is applied by Fournet (Fl. Guadeloupe Martinique 408. 1978) to plants with broad leaves (12-15 cm. wide) that are rounded at the apex with a short, abruptly formed apiculum. Such material in other floras is called *Pandanus dubius* Spreng.

"*Pandanus tectorius*" is commonly applied to plants occurring in culti-

vation in the Lesser Antilles (Questel, Fl. St. Barts 73. 1941; Fournet, Fl. Guadeloupe Martinique 409. 1978). According to St. John, this is a valid name for a species from Tahiti, but the holotype is a staminate inflorescence which can not be identified, and the description of the fruit is given in size only and is of no taxonomic usefulness. Authorities also differ in the choice of the author of the binomial as either Parkinson in 1773 or Warburg in 1900.

All species occurring in the Lesser Antilles have been introduced either directly or indirectly from the Pacific or Indian Ocean areas. Leaves of the larger plants are cut and used, after retting, for home industry production of baskets, mats, purses and toys, as well as woven into siding for beach houses. The pruning often causes prolific branching, abnormal elongation of the stem, and production of shorter leaves.

I am indebted to Dr. Harold St. John for his suggestions, which have been followed in this treatment.

COMMON NAMES: Screw pine, pandan, vacoua.

KEY TO THE SPECIES

1. Leaves green and variegated with longitudinal white or pale green stripes; sterile cultivated plants. *P. veitchii*
- 1a. Leaves all green, not variegated; fertile plants. 2
2. Stigmas oriented in various directions, located on the rim of the concave apex of the syncarp. *P. hahnii*
- 2a. Stigmas centripetal, apical on lobes of the phalanges. 3
3. Phalanges 8-9 cm. long, apical sinuses 6-14 mm. deep, the apical lobes hemispheric. *P. maximus*
- 3a. Phalanges less than 8 cm. long. 4
4. Stigmas openly distributed on broad convex apex of phalange; seeds median in phalange; stamens racemose. *P. odoratissimus*
- 4a. Stigmas crowded on flat, narrow apex of phalange; seeds in lower quarter of phalange; stamens umbellate. *P. utilis*

Pandanus hahnii Warb. in Engl., Das Pflanzenr. IV, 9: 56. 1900.

Phalanges 6- to 12-locular, 5 cm. long, 4-5 cm. broad, slightly compressed; apex 1.0-1.5 cm. wide, flat and scarcely grooved, shortly pyramidal below the apex, narrowed to the ultimate broadly truncate base; locular in the middle of the drupe, spongy mesocarp fibrous above.

OBSERVATIONS: Warburg attributed this new species to "(?) Ostafrikan. Inseln, kult. in Martinique (Hahn)." No material has been seen, and it is probable that this plant was introduced and cultivated in the Botanical Garden of St. Pierre, which was destroyed in the eruption of Mt. Pelée. The herbarium material in Berlin is no longer extant. The original description, paraphrased above in translation, is hardly useful.

Pandanus maximus Martelli in Webbia 2: 423. 1908.

Leaves 2.5 m. long or longer, 13 cm. wide, the apex long attenuate, the marginal teeth and those of the midrib robust. Fruit 30 cm. long, 25 cm.

in diameter; phalanges numerous, ca. 45, about 9 cm. long, the apical portion 6-8 cm. wide, subconvex, locules 11-13.

OBSERVATIONS: St. John reported the type of this species as *Hahn s.n.* (Fr) from Martinique. Martelli suggested the plant may have come from the Comores and was cultivated in Martinique. This, too, may have been in the Botanical Garden at St. Pierre.

***Pandanus odoratissimus* L. f., Suppl. 424. 1781.**

Type: *Thunberg s.n.*, Ceylon (U).

Woody plants, commonly branched. Leaves 1-2 m. long, 4-7 cm. wide, abruptly narrowed at the apex, margin spiny. Mature fruits bright yellow-orange; seeds in the middle of the phalange.

OBSERVATIONS: Stone (Gard. Bull. Singapore 22: 231-257. 1967) has discussed the identity, distribution and synonymy of this species. For the Flora of Guatemala (Fieldiana Bot. 24(1): 68. 1958), Standley and Steyermark considered this species a synonym of *P. tectorius* Soland., as does Fournet (Fl. Guadeloupe Martinique 409. 1978).

***Pandanus utilis* Bory, Voy. 2: 3. 1804.**

Type locality: Madagascar.

Woody plants, commonly much branched. Leaves 30-100 cm. long, 3-8 cm. wide, apex long attenuate. Mature fruits dark yellow-brown; seeds in the lower quarter of the phalange.

OBSERVATIONS: A staminate specimen (*Duss 2009* (NY)) represents a plant cultivated in the St. Pierre Botanical Garden, although Duss (Fl. Phan. Ant. Fr. 486. 1897) noted the plant was in the vicinity of St. Pierre in 1897.

***Pandanus veitchii* Veitch ex Dalliere in Gard. Chron. 2: 349. 1868.**

Type: Illustration, Gard. Chron. 2: 349.

Woody plants to 10 m. tall, often seen as young plants. Leaves spirally arranged, linear, 60-100 cm. long, 5-8 cm. broad, spiny-margined, variegated with longitudinal bands of yellow or green. Flowers and fruits unknown.

OBSERVATIONS: The plants were originally introduced by the Veitch nursery in London in 1868 and described only as "a beautiful sort, with white edged curving leaves." Plants which may be this species have been seen in cultivation on Martinique and Grenada but, being sterile, were not collected.

Walker (Fl. Okinawa 139. 1976) considered cultivated material of that area to be a variegated form of *P. boninensis* Warb. B. C. Stone (Ceylon Jour. Sci. 11(2): 121. 1975) doubted if *P. veitchii* Hort. could be distinguished from *P. tectorius* var. *saneri*. Questel (Fl. Guad. 174. 1951) and Fournet (Fl.

Guadeloupe Martinique 408. 1978) recognized *Pandanus variegatus* Miq., which may or may not be distinct. Small plants called *P. variegatus* usually have the young leaves white rather than yellowish or with green.

POTAMOGETONACEAE

POTAMOGETONACEAE Dumortier, Anal. Fam. 59, 61. 1829.

FIGURE 1.

Freshwater, rooted aquatic herbs; stems elongate. Leaves alternate, sheathing at the base. Inflorescence spicate, axillary, pedunculate. Flowers perfect; perianth of 4, clawed, valvate segments; stamens 4, attached to the claws, the anthers sessile; ovary of 4 carpels, each with a solitary ovule, the stigmas mostly sessile. Fruit drupaceous, indehiscent, exocarp fleshy or spongy.

TYPE GENUS: *Potamogeton* L.

Two genera and about 100 species comprise this cosmopolitan waterweed family.

POTAMOGETON Linnaeus

Potamogeton L., Sp. Pl. 1: 126. 1753.

Perennial freshwater herbs with submerged and floating stems. Leaves alternate, 2-ranked, often with thin, narrow submerged leaves and petiole, broad-bladed floating leaves. Inflorescence axillary, spicate, erect and often above water. Flowers perfect; tepals 4; stamens 4, the connective commonly enlarged; carpels 4, each with 1 ovule, the stigma generally sessile. Fruit of 4 drupelets.

TYPE SPECIES: *Potamogeton natans* L.

A cosmopolitan genus of about 100 species.

Potamogeton nodosus Poir. in Lam., Encycl. Méth. Bot. Suppl. 4: 535. 1816.

Type: *Broussonet*, Canary Islands.

Syn.: *Potamogeton fluitans* auct., non Roth.; Griseb., Fl. Br. W. Ind. Isl. 506. 1864; Duss, Fl. Phan. Ant. Fr. 472. 1897.

Potamogeton occidentalis Sieber ex Cham. & Schlecht. in Linnaea 2: 224. 1827. (Type: *Poiteau*, Dominican Republic.)

Potamogeton americanus Cham. & Schlecht. in Linnaea 2: 226, f. 26. 1827. (Type: Not specified.)

Rooted plants with ascending, terete, branched stems. Submerged leaves linear- to elliptic-lanceolate, 10–25 cm. long, 7–27 mm. wide; floating leaves with petioles 5–7 cm. long, blades lanceolate to broadly elliptic, 6–10 cm. long, 2–3 cm. wide, the apex acute or acuminate, the base rounded or acute. Spikes cylindrical, 2–5 cm. long. Fruit obovoid, 3.0–4.5 mm. long, crested.



FIGURE 1. Potamogetonaceae. *Potamogeton nodosus*, $\times 0.3$.

GENERAL DISTRIBUTION: Europe, Asia, United States, Central America, Greater Antilles, South America.

DISTRIBUTION IN LESSER ANTILLES: Dominica!, Martinique!.

COMMON NAMES: Waterweed, zèbe d'eau, zèbe-rivière.

RUPPIACEAE

RUPPIACEAE Hutchinson, Fam. Fl. Pl. 2: 48. 1934.

FIGURE 2.

Aquatic herbs of fresh or brackish water; stems long and slender. Leaves alternate or opposite, linear, sheathing at base. Flowers perfect, in short terminal spikes extending on elongated peduncles, enclosed in leaf base; perianth lacking; stamens 2, the filaments short; carpels 4, each with 1 ovule, the style wanting, the stigma peltate. Fruit drupaceous, at first sessile, becoming long-stipitate, indehiscent.

TYPE GENUS: *Ruppia* L.

The family consists of a single genus with two species.

RUPPIA Linnaeus

Ruppia L., Sp. Pl. 1: 127. 1753.

Submerged aquatic herbs with threadlike, forking stems. Leaves linear. Flowers racemose but appearing umbellate, initially within leaf sheath, the short peduncle greatly elongating and becoming loosely, spirally coiled; stamens 2, the anthers 2-celled, separated by connective; carpels 4, sessile, becoming long stipitate, the ovule pendulous from apex. Drupelets oblique, topped with elongated neck.

TYPE SPECIES: *Ruppia maritima* L.

A temperate and subtropical genus of two species.

KEY TO THE SPECIES

- 1. Leaves attenuate at apex. *R. maritima*
- 1a. Leaves obtuse or rounded at apex. *R. cirrhosa*

Ruppia cirrhosa (Petagna) Grande in Bull. Orto Bot. Univ. Nap. 5: 58. 1918.

Basionym: *Buccaferrea cirrhosa* Petagna in Inst. Bot. 5: 1826. 1787.

Type locality: "In Lacu vulgo di Licola."

Syn.: *Ruppia spiralis* L. ex Dumort., Florul. Belg. 164. 1827, nom. nud.

Submerged herb of fresh water. Leaves, stems and peduncles spiral, the leaf tips obtuse or rounded.



FIGURE 2. Ruppiceae. a-c, *Ruppia maritima*: a, habit, $\times 0.7$; b, fruiting axis, $\times 8$; c, staminate inflorescence, $\times 8$.

OBSERVATIONS: In a manuscript note in the British Museum, Box reported this species from Antigua. No supporting collections were found in the herbarium.

Ruppia maritima L., Sp. Pl. 1: 127. 1753.

Type locality: Europe.

Slender stems to 1 m. long. Leaves linear to filiform, 3-10 cm. long. Fruiting peduncles capillary, to 30 cm. long; pedicels 4 or more, arranged in a pseudumbel 1.0-3.5 cm. long; drupelets oblique or gibbous at base, 2-3 mm. long, long- or short-pointed at apex.

GENERAL DISTRIBUTION: Europe, Asia, United States, Mexico, Central America, Greater Antilles, South America.

DISTRIBUTION IN LESSER ANTILLES: Anguilla!, St. Barts!, Antigua!, Barbuda!, Nevis!, Guadeloupe!, Les Saintes!, Martinique!, the Grenadines!, Grenada!, Barbados!.

CYMODOCEACEAE

CYMODOCEACEAE N. Taylor, N. Am. Fl. 17(1): 31. 1909. FIGURE 3.

Submerged perennial herbs, rooted in marine sand, the rhizomes monopodial, elongate. Leaves linear, sheathed at base. Plants monoecious or dioecious. Flowers solitary and axillary or cymose, with perianths wanting. Staminate "flower" of two stalked fused anthers, longitudinally dehiscent, pollen threadlike; pistillate "flower" of 2 carpels, tanniferous cells present, the stigmas slender. Fruit nutlike, 1-seeded.

TYPE GENUS: *Cymodocea* C. König, nom. cons.

A family of five genera and 16 species occurring in warm seas. For more information, see: C. den Hartog, The sea-grasses of the world, in Verh. Konin. Nederl. Akad. Wetens., Afd. Natuurk.; Tweede Reeks, Deel 59, No. 1: 144-186. 1970.

KEY TO THE GENERA

1. Leaf blades subulate, terete or nearly so; flowers in cymose inflorescences; styles 2. *Syringodium*
- 1a. Leaf blades flat, toothed at apex; flowers solitary; style 1. *Halodule*

HALODULE Endlicher

Halodule Endl., Gen. Pl. Suppl. 1: 1368. 1841.

Syn.: *Diplanthera* Thouars, Gen. Nov. Madag. 2: 3. 1806, non Gleditsch, 1764.

Creeping, rooted, dioecious, marine plants; the short, erect stems with 1-4 leaves at each node. Leaf sheath 1-6 cm. long, persisting; blades linear,

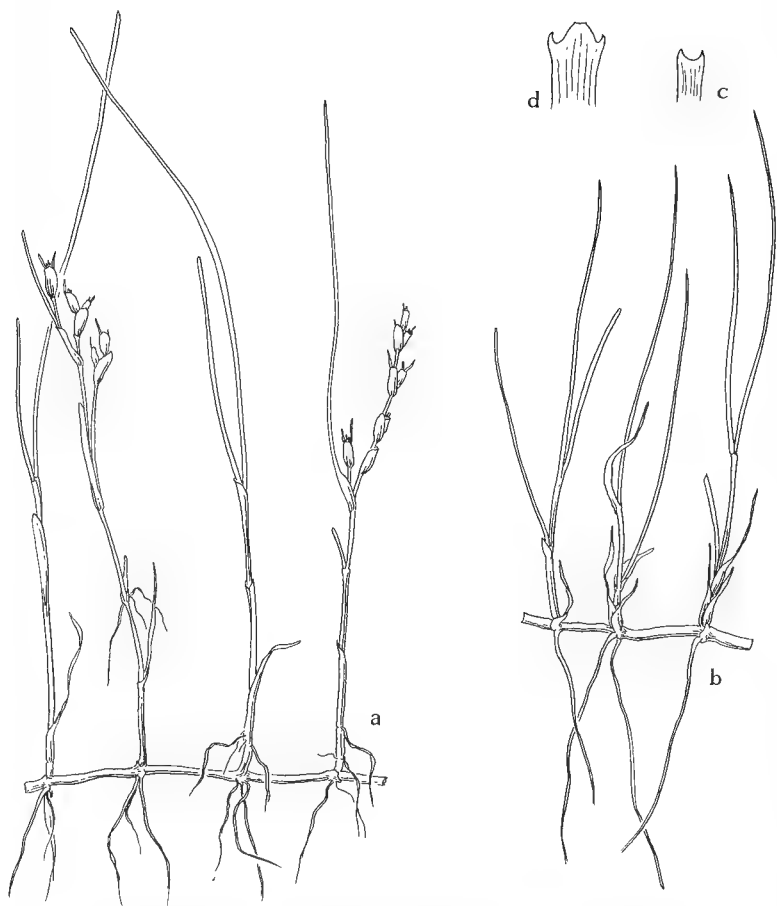


FIGURE 3. Cymodoceaceae. a, *Syringodium filiforme*, $\times 0.5$. b-d, *Halodule*: b, c, *H. wrightii*: b, habit, $\times 0.5$; c, leaf apex, $\times 10$; d, *H. beaudettei*, leaf apex, $\times 10$.

flat. "Flowers" solitary and "terminal," enclosed in leaf sheath; staminate "flower" stalked, consisting of 2 anthers at different levels; pistillate "flower" subsessile, consisting of 2 free ovaries, the styles long. Fruit drupaceous, subglobose-ovoid, slightly compressed, beak short.

TYPE SPECIES: *Halodule australis* Miq., correctly known as *Halodule uninervis* (Forssk.) Ascherson, based on *Zostera uninervis* Forssk.

A genus of six species occurring in shallow tropical seas.

KEY TO THE SPECIES

1. Leaf tip bicuspidate, appearing emarginate. *H. wrightii*
- 1a. Leaf tip acute, with two small lateral cusps, median lobe to 10 times the size of lateral teeth. *H. beaudettei*

Halodule beaudettei (den Hartog) den Hartog in *Blumea* 12: 303, f. 5. 1964.

Basionym: *Diplanthera beaudettei* den Hartog, *Pacif. Natur.* 1(15): 4, f. 2a-c. 1960.
Type: Panama, Dawson 21104 (L).

Rhizomes creeping. Leaf sheath 1.6-6.0 cm. long; blade 5-20 cm. long, 0.5-1.5 mm. wide, often widening above, leaf tip with prominent acute median tooth 1-10 times as long as narrow lateral cusps. Flowers and fruit unknown.

GENERAL DISTRIBUTION: United States, Central America, Cuba, Jamaica, South America.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe, Marie Galante.

Halodule wrightii Aschers. in *Sitz.-Ber. Ges. Naturf. Freunde Berlin* 1868: 19, 24. 1868.

Type: Cuba, Wright 3720 (K).

Syn.: *Diplanthera wrightii* (Aschers.) Aschers. in *Engl. & Prantl, Naturpf. Nachtr.* 37. 1897.

Rhizome creeping. Leaf sheath 1.5-4.0 cm. long; blades 5-18 cm. long, 0.3-1.0 mm. wide, apex seeming emarginate with two lateral teeth protruding. Staminate "flower" on stalk 12-23 mm. long, the anthers slender, 3.5-5.0 mm. long, bearing tannin cells; pistillate "flowers" with ovary ellipsoid, ovoid or globose, 1.5-2.0 mm. long, with terminal or subterminal style 10-28 mm. long. Fruit ovoid or globose, compressed, 1.5-2.0 mm. long.

GENERAL DISTRIBUTION: Greater Antilles, Africa, Australia.

DISTRIBUTION IN LESSER ANTILLES: Anguilla!, St. Martin, St. Barts!, Guadeloupe!, La Desirade, Marie Galante!, Dominica!, Martinique!, St. Vincent!, the Grenadines!, Grenada!.

SYRINGODIUM Kützing

Syringodium Kützing in Hohenacker, "Meeralgen" 9: no. 426. 1860.

Plants dioecious, the rhizomes creeping, monopodial, the short shoots with 2 or 3 leaves. Leaf sheath broad, 1.5–6.0 cm. long, persisting; blade subulate. Inflorescence cymose, lower branches dichasial. "Flowers" enclosed by reduced leaf; staminate "flower" stalked, of two anthers which are connate below and attached to the perianth at same height; pistillate "flowers" sessile, of 2 free ovaries, each with a short style which divides into 2 short stigmas. Fruit drupaceous, obliquely ellipsoid, the rostrum short and bifid.

TYPE SPECIES: *Syringodium filiforme* Kütz.

A genus of two species, one in the Carribean and one in the Indian and western Pacific regions. See also: P. B. Tomlinson and U. Posluszny, Aspects of floral morphology and development in the seagrass *Syringodium filiforme* (Cymodoceaceae), in Bot. Gaz. 139: 335–345. 1978.

Syringodium filiforme Kütz. in Hohenacker, "Meeralgen" 9: no. 426. 1860.

Type: *Hohenacker* 426 (fide Dandy & Tandy in Jour. Bot. London 77: 115. 1939).

Syn.: *Cymodocea manatorum* Aschers. in Sitz.-Ber. Ges. Naturf. Freunde Berlin 1868: 19, 24. 1868; Boldingh, Fl. Dutch W. Ind. Isl. 12. 1909.

Cymodocea filiforme (Kütz.) Correll in *Wrightia* 4: 74. 1968; Fournet, Fl. Guadeloupe Martinique 60. 1978.

Rhizome stout. Leaf sheaths 2.5–6.0 cm. long; blade 10–30 cm. long, 0.8–2.0 mm. wide, narrowed at the base. Inflorescence with sheath of reduced leaves. Staminate "flower" on stalk 5–10 mm. long, the anthers ovate, 3–4 mm. long; pistillate "flower" sessile, ovary ellipsoid, 3–4 mm. long, the style 2–3 mm. long, the stigmas 4–6 mm. long. Fruit obliquely obovoid, 6–7 mm. long, the rostrum 2–3 mm. long, bifid.

GENERAL DISTRIBUTION: United States, Central America, Greater Antilles, South America.

DISTRIBUTION IN LESSER ANTILLES: St. Martin!, Barbuda!, Saba, Guadeloupe!, Marie Galante!, Dominica!, Martinique!.

NAJADACEAE

NAJADACEAE A. L. Jussieu, Gen. 18. 1789, nom. cons.

FIGURE 4.

Slender submerged aquatic plants with fibrous roots and much-branched stems. Leaves opposite or whorled, the sheaths basal, rounded or auriculate, entire or toothed, the blades linear, spinose on the margins and/or back. Plants monoecious or dioecious; flowers solitary, axillary; staminate flowers with a double, perianthlike envelope, the inner hyaline, the outer 4-lobed



FIGURE 4. Najadaceae. a, b, *Najas guadalupensis*: a, habit, $\times 1.5$; b, fruit in leaf axil, $\times 9$.

or entire, one sessile stamen per flower; pistillate flower of a single pistil, the style short or wanting, the stigmas 2-4. Fruit a single-seeded drupelet.

TYPE GENUS: *Najas* Linnaeus.

A cosmopolitan family of submerged freshwater annuals, classified in a single genus of about 50 species. For more information about the family, see R. R. Haynes, The Najadaceae in the Southeastern United States, in Jour. Arnold Arb. 58: 161-171. 1977.

NAJAS Linnaeus

Najas L., Sp. Pl. 2: 1015. 1753.

Plants herbaceous, glabrous, submerged in fresh or brackish water, monoecious or dioecious. Stems slender, much-branched, rooting below, sometimes with spinulose teeth on the internodes. Leaves opposite or appearing whorled, sessile, sheathed; blade linear, flattened, 1-nerved, sometimes abaxially toothed on the midrib, margins usually serrulate, apex acute to acuminate. Flowers axillary, sessile or short-pedunculate, solitary or clustered; perianth wanting; staminate flowers subtended by one or two clear to purple, membranous envelopes, the pedicels short, elongating at anthesis, each flower consisting of a single sessile anther; pistillate flowers sessile, without an envelope, pistil with a short 3- or 4-branched style, ovary 1-loculate, ovule solitary, basal. Fruit 1-seeded; seed fusiform, surface with rectangular areolae in 15-40 rows.

TYPE SPECIES: *Najas marina* L.

For more information on the genus, see R. R. Haynes & W. A. Wentz, Notes on the Genus *Najas*, Sida 5: 261. 1974.

KEY TO THE SPECIES

1. Leaves flaccid, scarcely toothed; plants monoecious. *N. guadalupensis*
- 1a. Leaves rigid, coarsely toothed; plants dioecious. *N. marina*

Najas guadalupensis (Spreng.) Magnus in Engler & Prantl, Nat. Pflanzenfam. 2(1): 217. 1889.

Basionym: *Caulinia guadalupensis* Spreng., Syst. 1: 20. 1825.

Type: Berlin (destroyed).

Submerged plants in fresh or brackish water, forming dense tangled mats. Leaves numerous, opposite or clustered; blades linear, 10-25 mm. long, 0.5-1.5 mm. broad, apex acute or obtuse, margins with numerous minute teeth; sheaths rounded, with 5-10 teeth. Stamens 2-3 mm. long; pistil 1.0-2.5 mm. long. Fruit 2 mm. long, tipped with spinulose processes; seeds narrowly ellipsoid, conspicuously reticulate.

GENERAL DISTRIBUTION: United States, Mexico, Central America, Greater Antilles, South America.

DISTRIBUTION IN LESSER ANTILLES: Antigua!, Guadeloupe!.

Najas marina L., Sp. Pl. 2: 1015. 1753.

Type: LINN 1156.1, type locality uncertain.

Syn.: *Najas major* All., Fl. Pedemont. 2: 221. 1785; Griseb., Fl. Br. W. Ind. Isl. 507. 1864.

Submerged marine plants; stems rather stout, much-branched, 20–40 cm. long, internodes spinulose. Leaves opposite, linear, 1.0–4.5 cm. long, rigid, with coarsely triangular-dentate margins. Flower dioecious. Fruit 3–4 mm. long.

GENERAL DISTRIBUTION: Mexico, Central America, Greater Antilles, South America, Europe, Asia.

DISTRIBUTION IN LESSER ANTILLES: Antigua!, Guadeloupe!, Barbados.

ALISMATACEAE

ALISMATACEAE Ventenat, Tabl. Règne Veg. 2: 157. 1799. FIGURE 5.

Herbaceous water or marsh plants with perennial rhizomes. Leaves basal, petiolate, sheathing. Inflorescence scapose, simple or branched racemes or panicles. Flowers perfect or unisexual; sepals 3, persistent; petals 3, imbricate, fugacious; stamens 3, 6, or more; pistils 3 or more, the ovary 1-celled, usually with a solitary ovule, the style terminal, the stigma capitate. Fruit a 1-seeded achene.

TYPE GENUS: *Alisma* Linnaeus.

A cosmopolitan family of 13 genera and about 90 species.

KEY TO THE GENERA

- 1. Flowers perfect. *Echinodorus*
- 1a. Flowers unisexual, plants monoecious or dioecious. *Sagittaria*

ECHINODORUS L. C. Richard

Echinodorus L. C. Richard ex Engelm in A. Gray, Man. 460. 1848.

Perennial or annual marsh herbs. Leaves long-petiolate. Scapes elongate; inflorescence of remotely whorled racemes, these often repent and rooting. Flowers perfect; sepals 3, persistent; petals 3, deciduous; stamens 12–30; carpels numerous, inserted on a convex or globose receptacle, the style oblique, persistent, the stigma simple. Achenes compressed, ribbed and beaked, forming bristly heads.

LECTOTYPE SPECIES: *Echinodorus rostratus* (Nuttall) Engelm, based on *Alisma rostrata* Nuttall.

About thirty species from America and Africa comprise this genus.



FIGURE 5. Alismataceae. a-e, *Echinodorus berteroi*: a, habit, $\times 0.3$; b, staminate inflorescence, $\times 0.5$; c, staminate flower, $\times 1$; d, pistillate flower, $\times 2$; e, achene, $\times 3$.

Echinodorus berteroi (Spreng.) Fassett in *Rhodora* 57: 139. 1955.

Basionym: *Alisma berteroi* Spreng., *Syst.* 2: 163. 1825.

Type: Guadeloupe, *Bertero s.n.*

Syn.: *Alisma cordifolium* Kunth, *Enum.* 3: 152. 1841, non L. (Type: *Herb. Willd.* 7108.)

Alisma berterioanum Balbis in R. & S., *Syst. Veg.* 7: 1605. 1830. (Type: *Bertero*, without locality.)

Echinodorus cordifolius Griseb., *Fl. Br. W. Ind. Isl.* 505. 1864, non L.; Duss, *Fl. Phan. Ant. Fr.* 472. 1897.

Herb of wet areas; rhizome short, erect. Leaves variable in size and shape; petioles to 20 cm. long; blades usually broadly ovate, 6 cm. long, 5.5 cm. wide, shallowly cordate at the base, occasionally smaller and narrower or, if submerged, ribbonlike and membranous. Scapes exceeding the leaves, lower branches of inflorescence compound; petals cream to white. Achenes numerous, broadly keeled, each face with 2 winged ribs and 3 wingless ribs, beak slender, to 2 mm. long.

GENERAL DISTRIBUTION: Southern United States, Mexico, Central America, Greater Antilles, South America.

DISTRIBUTION IN LESSER ANTILLES: Antigua!, Guadeloupe!, Marie Galante!, Barbados!.

COMMON NAMES: Water plantain, plantain d'eau.

OBSERVATIONS: Specimens were collected on Guadeloupe in roadside ditches and evanescent pasture ponds. Records show that inflorescences were often repent, rooting freely along the flowering axes thus producing large rings of secondary plantlets.

DOUBTFUL SPECIES

Sagittaria lancifolia L., *Syst. ed.* 10. 1270. 1759.

This species, common in the Greater Antilles, was reported by Britton (*Sci. Sur. Porto Rico* 5(1): 15. 1923) to occur from "Cuba to Barbados." Vélez (*Herb. Angiosperms* 72. 1957) stated that it occurred on St. Martin, St. Kitts, Montserrat, Guadeloupe and Barbados. The taxon is not reported from Barbados by Gooding *et al.* (1965), but Fournet (*Fl. Guadeloupe Martinique* 57. 1978) credits Britton with a record from Guadeloupe. No validating specimens have been seen for the Lesser Antilles.

LIMNOCHARITACEAE

LIMNOCHARITACEAE Takhtajan

FIGURE 6.

Perennial aquatic herbs. Leaves basal, petiolate, blades flat. Inflorescence scapose, the flowers borne in an umbel. Flowers perfect, subtended by membranous bracts; sepals 3, persistent, coriaceous or spongy, thick, green; petals 3, thin, fugacious; stamens hypogynous, free, numerous,



FIGURE 6. Limnocharitaceae. *Limnocharis flava*, $\times 0.5$.

whorled, the outer whorl sterile, the filaments flattened, the anthers attached basally; carpels usually 6, each 1-celled, with numerous, scattered ovules, the style wanting, the stigmas sessile. Fruiting carpels 1-celled, free or united, dehiscing on the inner side; seeds numerous, small, testa smooth or cristate; embryo curved.

TYPE GENUS: *Limnocharis* Humboldt & Bonpland.

Four genera and seven species are included in this tropical aquatic family.

OBSERVATIONS: The family Limnocharitaceae is credited to Takhtajan with the date 1954 but a pertinent reference and description cannot be found. Takhtajan (Die Evolution der Angiospermen, p. 261. 1959) listed the family but with the year 1954 and supplied six references not all of which are available to me. He noted that Kuprijanowa (Arbeiten des W.-L.-Komarow-Inst. f. Botanik an d. Akad. d. Wiss. der UdSSR, Serie I, H. 7, 163-262. 1948 [not available]) and Kimura (Notulae Syst., Paris, 15(2): 137-159. 1956) accepted the family as has H. K. Airy Shaw (in J. C. Willis, Dictionary of the Flowering Plants and Ferns, ed. 8. 670. 1973). Valid publication of this family is not known and perhaps is wanting.

LIMNOCHARIS Humboldt & Bonpland

Limnocharis H. & B., Pl. Aequin. 1: 116. 1807.

Perennial aquatic or marsh plants. Leaves petiolate; blades flat. Inflorescence scapose. Flowers on long pedicels, umbellate, bracteate at the base, perfect; sepals 3, spongy, persistent; petals 3, thin, fugacious; stamens numerous, the outer sterile; carpels 15-20, compressed; styles wanting, the stigma sessile. Fruiting carpels thickened on the back, furrowed; seeds hippocrepiform.

TYPE SPECIES: *Limnocharis emarginata* H. & B., nom. illeg., correctly known as *L. flava* (L.) Buch., based on *Alisma flava* L.

A monotypic genus, the single species occurring in tropical South America and the West Indies.

Limnocharis flava (L.) Buch. in Abh. Nat. Ver. Bremen 2: 2. 1868.

Basionym: *Alisma flava* L., Sp. Pl. 1: 343. 1753.

Lectotype: Plumier, Pl. Amer., t. 115. 1757.

Syn.: *Limnocharis emarginata* H. & B., Pl. Aequin. 1: 116. 1807, illeg.

Limnocharis plumieri Rich. in Mem. Mus. Hist. Nat. Paris 1: 374. 1815.
(Type locality: San-Domingo.)

Perennial marsh herb, with short, thick rootstock. Leaves basal, petioles to 45 cm. long, spongy, sharply triangular; blades elliptic to orbicular, to 30 cm. long, 15 cm. wide, slightly cordate at the base, apex rounded, apiculate or emarginate. Scape erect to 40 cm. long, angled or winged; umbel of 7-15 flowers, bracts membranous, pedicels 3-5 cm. long, angled;

sepals and petals broadly ovate to orbicular, 12-18 mm. long, petals yellow. Fruiting carpels 12-15 mm. long, 6-8 mm. wide.

GENERAL DISTRIBUTION: Mexico, Central America, Cuba, Hispaniola, northern South America.

DISTRIBUTION IN LESSER ANTILLES: Grenada!

OBSERVATIONS: A single collection by Broadway in the Tauheen swamp, Parish of St. George's, Grenada, in July, 1905, was widely distributed. The plant was said to be naturalized. The swamp is unknown today, and the taxon has not been recollected in the Lesser Antilles.

HYDROCHARITACEAE

HYDROCHARITACEAE A. L. Jussieu, Gen. 67. 1789.

FIGURE 7.

Annual or perennial aquatic plants having either a creeping monopodial rhizome with roots at the nodes and distichous leaves or an erect axis with roots at base and spirally arranged leaves. Leaves eligulate, submerged or floating, linear, lanceolate, elliptic, ovate or orbicular, either sessile and sheathed or with petiole and leaf blade. Flowers regular, unisexual or bisexual, sessile or pedicellate, solitary or in cymose inflorescences in a spathe of two free or connate leaves; perianth of 1 or 2 whorls, each of 3 free segments; stamens 3-several in 1 or more whorls, the filaments slender or absent; ovary inferior, 3-15-carpellate, with several ovules, styles 3-15. Fruit indehiscent, pericarp fleshy or membranaceous; seeds fusiform, ellipsoid or globose.

TYPE GENUS: *Hydrocharis* L.

A family of tropical and temperate marine or freshwater plants classified in 16 genera and about 80 species. See also: C. den Hartog, The sea-grasses of the world, in Verh. Konin. Nederl. Akad. Wetens., Afd. Natuurk.; Tweede Reeks, Deel 59, No. 1: 212-275. 1970.

KEY TO THE GENERA

1. Submerged, rooting marine plants. 2
- 1a. Submerged or floating fresh water plants. 3
2. Leaves linear or strap-shaped, 1 cm. or more wide, 6-60 cm. long. *Thalassia*
- 2a. Leaves petiolate, the blades oblong-linear, 1-2 cm. long. *Halophila*
3. Submerged plants; leaves linear, scattered along the stem, opposite or verticillate. *Elodea*
- 3a. Floating plants rarely rooted in shallow water; leaves petiolate, blades orbicular. *Limnobium*

Elodea densa (Planch.) Casp.

Fournet (Fl. Guadeloupe Martinique 56. 1978) reported that this species was introduced to the French islands from Argentina in 1940 and has



FIGURE 7. Hydrocharitaceae. a, *Thalassia testudinum*, $\times 0.5$. b, *Limnobium laevigatum*, $\times 0.5$. c, *Halophila decipiens*, $\times 1$.

become naturalized according to Pinchon (d'Autres Asp. Nat. Ant. 25. 1971). No specimens have been seen and no specific locality given. The correct name for this taxon appears to be *Anacharis densa* (Planch.) Vict.

HALOPHILA Thouars

Halophila Thouars, Gen. Nov. Madag. 2: 2. 1806.

Submerged, rooted, monoecious or dioecious herbs. Rhizomes slender with erect short shoots, bracteate at the base or above. Leaves two or more in pseudowhorls, sessile or petiolate, linear to elliptic or ovate, entire or serrulate. Spathe of 2 sessile, elliptic to ovate bracts. Flowers solitary; staminate flowers pedicellate, with 3 tepals and 3 stamens; pistillate flowers sessile, the ovary ellipsoid, unilocular, the hypanthium elongate with reduced tepals, styles 3-5, linear. Fruit ovoid, rostrate, pericarp membranaceous; seeds few to several, globose.

LECTOTYPE SPECIES: *Halophila madagascariensis* Doty & Stone.

A genus of four species occurring along tropical coasts in the Indian and Pacific oceans and in the Caribbean.

KEY TO THE SPECIES

1. Erect lateral shoots with 1 pair of leaves; anthers 1 mm. long; styles 2.5 mm. long. *H. decipiens*
- 1a. Erect lateral shoots with a pseudowhorl of 4-8 leaves; anthers 4 mm. long; styles 10-30 mm. long. *H. baillonis*

Halophila decipiens Ostenfeld in Bot. Tidsskr. 24: 260. 1902.

Lectotype: *J. Schmidt* 540 (c), Koh Kahdat, Thailand.

Syn.: *Halophila baillonis* of American auct., non Ascherson.

Monoecious herbs; rhizome thin, lateral shoots with 1 pair of leaves. Leaves with petioles 3-15 mm. long; blades oblong-elliptic, 10-25 mm. long, 3-6 mm. wide, apex obtuse, base cuneate, margin finely serrulate. Spathe ovate, acuminate, 3-4 mm. long, containing 1 staminate and 1 pistillate flower. Staminate flower on pedicel 3 mm. long; tepals 1.0-1.5 mm. long; anther 1 mm. long. Pistillate flower subsessile; ovary 1 mm. long, the hypanthium 1-2 mm. long, the 3 styles each 2.5 mm. long. Fruit ellipsoid, 2.5 mm. long, beak 1.5-2.0 mm. long, pericarp scarious; seeds about 30, ovoid, 0.2 mm. long.

GENERAL DISTRIBUTION: Indian and Pacific oceans, Central America, Florida, Jamaica, Puerto Rico, northern South America.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe!, Dominica!, Martinique!, St. Vincent!, Barbados!.

Halophila baillonis Ascherson ex Dickie in Hook. f., in Jour. Linn. Soc. Bot. 14: 317. 1874.

Lectotype: *Dr. Moseley s.n.* (κ), Challenger Expedition, St. Thomas.

Syn.: *Halophila aschersonii* Ostenfeld in Bot. Tidsskr. 24: 239. 1902. (Type: Syn-types cited.)

Diocious herb, with thin rhizomes; lateral shoots with 2 or 3 pairs of leaves in an apical pseudowhorl. Leaves with petiole 2-5 mm. long; blades oblong, ovate or elliptic, 5-22 mm. long, 2-8 mm. wide, apex obtuse, base cuneate, margin finely spinulose. Spathe bracts lanceolate, 5-8 mm. long. Staminate flower on pedicel 3 mm. long; tepals 4 mm. long; anther 4 mm. long. Pistillate flower 6-7 mm. long; perianth minute; ovary sessile but extended into a hypanthium, with 2-5 styles each 10-30 mm. long. Fruit globular, 2-3 mm. in diameter, beak 4-5 mm. long, pericarp membranous; seeds 10-20, subspherical, apiculate at both ends.

GENERAL DISTRIBUTION: Panama, Jamaica, Puerto Rico, St. Thomas, Curaçao, Brazil.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe, *J. Feldmann* 3012, 3042, 3182 (PBVM).

OBSERVATIONS: H. N. Moseley (Jour. Linn. Soc. Bot. 14: 317. 1874) related that Dickie, reporting on the marine algae of St. Thomas and the Bermudas, said, "The marine phanerogams were sent to Dr. Ascherson; the following is an extract from his notes upon them. 'As to the *Halophila*, there can be no doubt that the flowers, unknown to me hitherto, will prove it to be a congener of *H. ovalis*, from which, however, it differs specifically in its serrulate leaves. This plant was found half a century ago by Bertero. We have in our collection (Berlin) a very imperfect specimen sent by Prof. Balbis, under the name of *Serpicula quadrifolia*. I do not know of any publication where the name is quoted, and have called the plant *Halophila baillonis*, because I got the first complete, though barren, specimens from Prof. Baillon ("Martinique, leg. Hahn").'"

Rydberg (N. Am. Fl. 17: 67. 1909) and authors of more recent floras have reversed the application of the name *baillonis*, since its specific epithet is clearly designated as "*quadrifolia*." Den Hartog (The sea-grasses of the world, p. 268) designated "*Dr. Moseley* (Type, κ)," a specimen from the Challenger Expedition of 1873 as what must be considered a neotype; he did not cite the Hahn material from Martinique.

LIMNOBIUM Richard

Limnobium Richard in Mem. Cl. Sci. Math. Phys. Inst. France 12(2): 66. 1804.

Syn.: *Hydromystria* G. F. W. Meyer, Fl. Esseq. 152. 1818. (Type species: *H. stolonifera* Meyer.)

Usually floating plants of fresh water, strongly stoloniferous. Leaves basal, petiolate; blades ovate to suborbicular. Plants monoecious or dioecious; staminate flowers 2 or 3; sepals 3; petals 3; stamens 6-12, the anthers linear; pistillate flowers solitary, enclosed in 2-cleft spathes; petals rudimentary or wanting; pistils 6-9, the ovary 1-celled, with 6 placentae, the styles 6. Fruit baccate, ellipsoid, many seeded.

TYPE SPECIES: *Limnobium bosci* Rich., nom. illeg., correctly known as *Limnobium spongia* (Bosc.) Steudel, based on *Hydrocharis spongia* Bosc.

An American genus of three species.

Limnobium laevigatum (Humb. & Bonpl.) Morton in Contr. U. S. Natl. Herb. 38: 270. 1973.

Basionym: *Salvinia laevigata* Humb. & Bonpl. ex Willd., Sp. Pl. ed. 4: 537. 1810.

Type: *Humboldt & Bonpland s.n.*, Colombia.

Syn.: *Hydromystria stolonifera* G. F. W. Meyer, Fl. Esseq. 153. 1818. (Type: No material cited or illustrated.)

Limnobium stoloniferum (Meyer) Griseb., Fl. Br. W. Ind. Isl. 506. 1864; Fournet, Fl. Guadeloupe Martinique 56. 1978.

Compact, floating plants or, if rooting in mud, the leaves often much-elongated. Leaves with petioles 3-25 mm. long (to 15 cm. in rooted plants); blades ovate to suborbicular, 2-8 cm. long, 1.5-6.0 cm. wide, apex obtuse, base long-cuneate, entire, fleshy or spongy. Staminate flowers with lanceolate sepals, white linear petals, and subulate filaments shorter than the anthers; pistillate flowers with a tubular hypanthium. Fruit not reported.

GENERAL DISTRIBUTION: Mexico, Central America, Cuba, Puerto Rico, South America.

DISTRIBUTION IN LESSER ANTILLES: Antigua!, Montserrat!, Guadeloupe!, Martinique!, St. Lucia!.

THALASSIA Banks & Solander ex König

Thalassia Banks & Solander ex König in Ann. Bot. 2: 96. 1805.

Marine herbs in contorted masses; rhizomes elongated, scaly, with erect short shoots bearing 2-6 eligulate, linear, falcate leaves, sheathing at the base. Inflorescence pedunculate, consisting of 1 or 2 staminate flowers and 1 pistillate flower; spathes connate or partially so. Staminate flower short-pedicellate; perianth segments 3; stamens 3-12, subsessile; pistillate flower subsessile; perianth segments 3; ovary muricate, unilocular, the 6-8 styles each split into 2 filiform segments, the stigmas longer than styles. Fruit globose, echinate, beaked, pericarp fleshy, splitting irregularly; seeds few, 8-10 mm. long.

TYPE SPECIES: *Thalassia testudinum* Banks & Solander ex König.

This genus is comprised of two species of submerged aquatic plants of coastal areas; one native to the Caribbean area and one found in the Indian and Pacific regions.

Thalassia testudinum Banks & Solander ex König in Ann. Bot. 2: 96. 1805.

Type: Not selected.

Plants submerged, rooted, the rhizomes elongate, contorted, dichotomous. Short shoots erect, sheaths persistent, 6–10 cm. long. Leaf blades linear, 10–60 cm. long, 4–12 mm. wide, the apex obtuse, the margin entire to slightly serrulate. Peduncle of staminate flower 3–7 cm. long; spathe 1.5–3.0 cm. long; tepals 2–10 mm. long; stamens 9, the anthers oblong, 8–9 mm. long. Peduncle of pistillate flower 3–4 cm. long; spathe 1.5–2.0 cm. long; ovary 1 cm. long, the styles 7 or 8, each 1.5–2.0 cm. long. Fruit ellipsoid to globose, echinate, splitting irregularly, 1.5–2.0 cm. long, beak 4–7 mm. long; seeds 3, pyriform, to 10 mm. long.

GENERAL DISTRIBUTION: Southern United States, Central America, Greater Antilles, northern South America.

DISTRIBUTION IN LESSER ANTILLES: St. Martin!, St. Barts!, Antigua!, Guadeloupe!, Marie Galante!, Dominica!, Martinique!, Grenada, Barbados.

COMMON NAME: Turtle grass.

OBSERVATIONS: König cited references to Brown and Sloane and a Smeathman specimen from Antigua. A lectotype has not been selected.

No fertile material has been seen from the Lesser Antilles. Drifted up-rooted specimens are common in the area.

POACEAE

by Frank W. Gould¹

POACEAE Barnhart in Bull. Torrey Bot. Club 22: 7. 1895 (*nom. alt.*: GRAMINEAE A. L. Jussieu, Gen. Pl. 28. 1789).

Annual or perennial herbs, infrequently trees, vines or woody shrubs. Roots fibrous, mainly adventitious; prop roots often developed at lower culm nodes. Culms with few to numerous solid nodes, the elongated internodes solid, semisolid or hollow. Leaves alternate, with a sheathing base and a usually flattened blade separated by a usually well-marked collar-throat region. Flanges of tissue (auricles), occasionally present on either side of the blade base or on either side of the sheath apex. A membranous or hairy rim (the ligule), usually present at base of blade. Blades usually

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elongate and lanceolate or linear but in many tropical and subtropical grasses of shaded sites they are short and broad, sometimes 3-10 cm. or more in width. Inflorescence a panicle, raceme, or spike, with flowers borne sessile or pediceled in spikelets. Spikelets unisexual or bisexual, usually with one or two bracts at the base (the glumes), with one to numerous florets borne alternately on a reduced axis (the rachilla). Each floret usually consisting of a flower enclosed between two bracts, the lemma (outer and odd-nerved) and the palea (inner and 2-nerved). Perfect grass flower usually with 3 stamens, a unilocular, one-seeded, indehiscent ovary, and usually two mounds of tissue, lodicules, at the base of the stamens, commonly interpreted as vestigial perianth segments. Typical grass fruit a caryopsis, with the pericarp adherent to the outer seed coat.

TYPE GENUS: *Poa* Linnaeus.

KEY TO THE GENERA

1. Culms hard and woody, 2-10 m. in height or length, persisting for 2-many years; spikelets with 1-several perfect florets. 2
- 1a. Culms herbaceous; if as much as 2 m. in height or length and appearing woody, then all spikelets unisexual. 6
2. Culms stiffly erect. 3
- 2a. Culms climbing or trailing, much-branched. 4
3. Plants flowering only at intervals of many years; leaf blades with a petiolelike constriction at base. 1. *Bambusa*
- 3a. Plants flowering annually; leaf blades not with a petiolelike constriction at base. 11. *Arundo*
4. Spikelets several-flowered. 2. *Arthrostylidium*
- 4a. Spikelets 2-flowered. 5
5. Upper floret perfect; lower floret staminate or neuter. 46. *Lasiacis*
- 5a. Upper and lower florets both perfect. 32. *Isachne*
6. Inflorescence a unilateral spike, with a few awnless, staminate spikelets below the several long-awned perfect spikelets. 68. *Heteropogon*
- 6a. Inflorescence not a unilateral spike with a few awnless staminate spikelets below several long-awned perfect spikelets. 7
7. Spikelets all unisexual. 8
- 7a. Spikelets bisexual, at least some with perfect florets. 15
8. Plants dioecious, the staminate and pistillate spikelets on separate plants; culms 2-10 m. tall. 13. *Gynerium*
- 8a. Plants monoecious, the staminate and pistillate spikelets on the same plant; culms tall or short. 9
9. Staminate and pistillate spikelets in separate inflorescences. 10
- 9a. Staminate and pistillate (or perfect) spikelets in the same inflorescence: spikelets, at least the pistillate, with glumes. 11
10. Plants with stout culms 1.5-5.0 m. tall; leaf blades 3 cm. or more broad; glumes present. 73. *Zea*
- 10a. Plants with slender culms much less than 1 m. tall; leaf blades 2 cm. or less broad; glumes absent. 9. *Luziola*
11. Pistillate spikelets enclosed in hard, bony, beadlike involucre. 71. *Coix*
- 11a. Pistillate spikelets not enclosed in hard, bony, beadlike involucre. 12

12. Glumes of pistillate spikelets thick and hard; inflorescence either a spike or consisting of 2-few stout spicate branches. 72. *Tripsacum*
- 12a. Glumes of pistillate spikelets thin, membranous; inflorescence paniculate, with slender branches. 13
13. Spikelets in pairs consisting of one sessile, pistillate and one long-pedicel, staminate. 3. *Pharus*
- 13a. Spikelets not in pairs of one pistillate and one staminate. 14
14. Leaf blades commonly 1.5-3.0 cm. broad; fruit swollen on back. 5. *Lithachne*
- 14a. Leaf blades commonly 4-8 cm. broad; fruit not swollen on back. 4. *Olyra*
15. Leaf blades broadly lanceolate, with a petiolate base 1-3 cm. or more long. 10. *Orthoclada*
- 15a. Leaf blades narrow or broad, with a petiolate base less than 1 cm. long. 16
16. Spikelets 2-flowered with a single perfect floret above and a single reduced floret (staminate or neuter) below (both florets perfect in *Isachne*). 17
- 16a. Spikelets 1- to several-flowered, the reduced florets, when present, above the perfect ones. 18
17. Spikelets in pairs of 1 sessile or subsessile and 1 pedicel (2 pedicel at branch tips); pedicel spikelet like sessile one or more often reduced or rudimentary, occasionally represented by the pedicel alone; first glume large and firm, usually tightly clasping or enclosing the second glume (tribe Andropogoneae). GROUP I
- 17a. Spikelets in pairs or not; when paired, then first glume not larger and firmer than lemma of perfect floret and not clasping or enclosing second glume (first glume absent in several genera) (tribe Paniceae). GROUP II
18. Inflorescence a panicle with rebranched primary branches. GROUP III
- 18a. Inflorescence a spike, spicate raceme or panicle with unbranched primary branches. GROUP IV

GROUP I (TRIBE ANDROPOGONEAE)

1. Inflorescence a large, many-flowered panicle with numerous branches; spikelets all alike. 2
- 1a. Inflorescence not a large, many-flowered, many-branched panicle or if so, the spikelets not all alike. 5
2. Spikelets awnless; panicle long and contracted. 53. *Imperata*
- 2a. Spikelets awned; panicle broad, with at least the tips of the branches spreading. 3
3. Spikelets falling in pairs together with the readily disarticulating rachis. 54. *Saccharum*
- 3a. Spikelets falling separately from a persistent rachis. 4
4. Plants perennial, the culms tall and stout, usually in dense clumps. 52. *Miscanthus*
- 4a. Plants large but reportedly annual, the culm erect or trailing, not in dense clumps. 56. *Ischaemum*
5. Inflorescence a spike or spicate raceme. 6
- 5a. Inflorescence a panicle with 2-numerous branches. 12
6. Pedicels fused laterally to rachis; plants annual. 7
- 6a. Pedicels not fused laterally to rachis; plants annual or perennial. 8
7. Inflorescence less than 3 cm. long; sessile spikelet globose, deeply pitted. 70. *Hackelochloa*

- 7a. Inflorescence mostly 5-10 cm. long; sessile spikelet oblong and smooth. 69. *Rottboellia*
8. Awns 3-8 cm. long. 9
- 8a. Awns absent or 2 cm. or less long. 10
9. Plants perennial; spikelets with brownish hairs. 68. *Heteropogon*
- 9a. Plants annual; spikelets silky-villous with silvery hairs. 62. *Dictomis*
10. Pediceled spikelets like the sessile ones, both perfect and with geniculate awns; spikelets often in triads of 2 sessile and 1 pediceled. 67. *Polytrias*
- 10a. Pediceled spikelets staminate or neuter, never with a geniculate awn; spikelets never in triads. 11
11. Culms decumbent-spreading at base, often rooting at the nodes; pediceled spikelet about as large as the sessile one. 58. *Dichanthium*
- 11a. Culms tufted, not decumbent-spreading at base; pediceled spikelet reduced. 63. *Schizachyrium*
12. Panicles small and numerous on much-branched flowering branches, often forming densely congested flower clusters; panicles with 2-6 short spicate branches. 13
- 12a. Panicles terminating main culms or long branches, not much-branched and not forming densely congested flower clusters; panicles small to large and with few to numerous branches. 16
13. Spikelets awnless or with awns less than 2 cm. long; panicle branches 2-6. ... 14
- 13a. Spikelets with awns usually 3-6 cm. long; panicle branches 2. 15
14. Sessile and pediceled spikelets of lower pairs alike, staminate or neuter. 64. *Cymbopogon*
- 14a. Sessile and pediceled spikelets of lower pairs not alike, the spikelet perfect, the pediceled spikelet staminate, neuter or rudimentary. 61. *Andropogon*
15. Panicle branches each with a single, perfect, awned spikelet and several awnless, staminate or neuter spikelets. 66. *Themeda*
- 15a. Panicle branches each with 2-4 sessile, perfect, awned spikelets, the pediceled spikelets and the lowermost 2-3 spikelets of branch awnless and staminate or neuter. 65. *Hyparrhenia*
16. Pediceled spikelets completely reduced, the pedicels present at the lower nodes of the inflorescence branches but absent above; annual with blades 6 cm. long or less. 57. *Arthraxon*
- 16a. Pediceled spikelets present at all nodes; perennials with at least some blades more than 6 cm. long. 17
17. Pedicels, at least those above, and usually the upper rachis internodes, with a central groove or membranous area. 59. *Bothriochloa*
- 17a. Pedicels and rachis internodes flat or rounded, without a central groove or membranous area. 18
18. Pediceled spikelets awned; rachis nodes often with conspicuous tufts of long, silvery hairs. 56. *Ischaemum*
- 18a. Pediceled spikelets awnless; rachis nodes without tufts of long, silvery hairs. 19
19. Inflorescence branches relatively few, on a common axis 4 cm. long or less. 58. *Dichanthium*
- 19a. Inflorescence branches numerous, on a common axis usually 10-30 cm. long or more. 20
20. Outer glume of sessile spikelet (and often the pediceled spikelet) prickly, with 1-3 rows of short, stiff, spinescent hairs. 60. *Vetiveria*

- 20a. Outer glume of sessile spikelet smooth, without spinescent hairs. 55. *Sorghum*

GROUP II (TRIBE PANICEAE)

1. Spikelets in involucre of bristles or flattened spines that disarticulate with the spikelets. 2
- 1a. Spikelets not in bristly or spiny involucre, if subtended by bristles then these persistent. 3
2. Bristles or spines fused together, at least at the base. 50. *Cenchrus*
- 2a. Bristles and spines not fused together. 49. *Pennisetum*
3. Spikelets all or in part (at least those terminating the branchlets) subtended by 1-several bristles. 48. *Setaria*
- 3a. Spikelets not subtended by bristles. 4
4. Spikelets unisexual, the plants monoecious. 5
- 4a. Spikelets bisexual. 6
5. Inflorescences large, terminal on the main culms and leafy branches. 4. *Olyra*
- 5a. Inflorescences relatively small, mostly or all axillary, when terminal then with staminate spikelets only. 5. *Lithachne*
6. Inflorescence spike-like, with the spikelets partially embedded in a thick, corky rachis; first glume present. 41. *Stenotaphrum*
- 6a. Inflorescence not spike-like or if so then the first glume lacking. 7
7. Second glume awned, the first glume awned or awnless. 8
- 7a. Second and first glumes both awnless. 10
8. First glume minute; second glume and lemma of lower floret about equal, silky-villous. 31. *Rhynchelytrum*
- 8a. First glume well developed; spikelets not silky-villous. 9
9. First glume much shorter than the second, awnless or with an awn shorter than the body. 36. *Echinochloa*
- 9a. First glume about as long as the second, with an awn up to 3 times the length of the body. 37. *Oplismenus*
10. Lemma of lower floret bearing a delicate awn 1-10 mm. long between the lobes of a notched apex. 30. *Melinis*
- 10a. Lemma of lower floret awnless or with a stout awn from an entire apex. ... 11
11. Lemma of upper floret thin and flexible, with membranous margins not inrolled over the palea. 12
- 11a. Lemma of upper floret firm, with margins inrolled over the palea margins. ... 14
12. Lemma of upper floret minute, bearing a long, geniculate awn. 29. *Arundinella*
- 12a. Lemma of upper floret as long as spikelet, awnless. 13
13. First glume minute or absent. 33. *Digitaria*
- 13a. First glume at least $\frac{1}{2}$ the length of the spikelet. 44. *Hymenachne*
14. First glume absent on some or all spikelets. 15
- 14a. First glume present on all spikelets. 17
15. Lemma of upper floret mucronate or short-awned; cuplike or disclike ring present at base of spikelet. 38. *Eriochloa*
- 15a. Lemma of upper floret not mucronate or awned; cuplike or disclike ring not present at base of spikelet. 16

16. Lemma of upper floret with rounded back turned away from rachis; spikelets narrowly oblong, borne singly and widely spaced in 2 rows. 40. *Axonopus*
- 16a. Lemma of upper floret with rounded back turned toward the rachis; spikelets broadly ovate to oblong, closely placed and often paired in 2-4 rows. 43. *Paspalum*
17. Inflorescence of 2-several spicate, unbranched primary branches; first glume much shorter than second glume and lemma of lower floret. 18
- 17a. Inflorescence with some or all of the primary branches rebranched. 20
18. Second glume and lemma of lower floret scabrous-pubescent with short, stiff hairs. 36. *Echinochloa*
- 18a. Second glume and lemma of lower floret glabrous. 19
19. Plants annual; rachis of inflorescence branch winged, 1-2 mm. broad. 39. *Brachiaria*
- 19a. Plants perennial; rachis less than 1 mm. broad. 42. *Paspalidium*
20. Lemma of upper floret ciliate on margins with long silky hairs. 20. *Thysanolaena*
- 20a. Lemma of upper floret not ciliate on margins with long, silky hairs. 21
21. Lower floret of the spikelet similar to the upper, usually perfect. 32. *Isachne*
- 21a. Lower floret of the spikelet staminate or neuter, not similar to the upper. 22
22. Lemma and palea of upper floret with minute tufts of hair at the tips. 46. *Lasiacis*
- 22a. Lemma and palea of upper floret without tufts of hairs at the tips. 23
23. Inflorescence dense, contracted, cylindrical or lobed; plants of shallow water or marsh habitats. 24
- 23a. Inflorescence open or contracted but not dense; plants of varied habitats. 25
24. Second glume gibbous or saccate at base; grain stipitate. 45. *Sacciolepis*
- 24a. Second glume not gibbous or saccate; grain not stipitate. 44. *Hymenachne*
25. Lemma of upper floret with either lateral appendages or excavations at base. 47. *Ichnanthus*
- 25a. Lemma of upper floret with neither lateral appendages nor excavations at base. 26
26. Spikelets laterally compressed and distinctly gibbous, the lemma of upper glume conspicuously "humped up." 35. *Cyrtococcum*
- 26a. Spikelets not laterally compressed nor conspicuously gibbous. ... 34. *Panicum*

GROUP III (PANICLE WITH REBRANCHED BRANCHES)

1. Spikelets with a single floret. 2
- 1a. Spikelets with 2-several florets. 5
2. Glumes absent or represented by rudiments. 3
- 2a. Glumes present, well developed. 4
3. Spikelets 5 mm. long or less. 8. *Leersia*
- 3a. Spikelets 7-10 mm. long. 7. *Oryza*
4. Lemma with a 3-branched awn. 28. *Aristida*
- 4a. Lemma awnless. 19. *Sporobolus*
5. Lemmas with numerous long, bristly awns. 27. *Pappophorum*
- 5a. Lemmas awnless or with a single, short awn. 6
6. Culms stout, 2-several m. tall; spikelet with rachilla or lemmas villous. ... 7

- 6a. Culms slender, less than 1 m. tall; spikelet with glabrous or scabrous rachilla and lemmas. 8
- 7. Lemmas villous, rachilla glabrous. 11. *Arundo*
- 7a. Lemmas glabrous, rachilla villous. 12. *Phragmites*
- 8. Lemmas 3-nerved, awnless. 15. *Eragrostis*
- 8a. Lemmas 5-nerved, awned. 14. *Vulpia*

GROUP IV (SPIKE, SPICATE RACEME, OR UNBRANCHED PRIMARY BRANCHES)

- 1. Glumes (some) with hooked spines; spikelets deciduous in burrlike clusters. 26. *Tragus*
- 1a. Glumes without hooked spines; spikelets in burrlike clusters or not. 2
- 2. Inflorescence a spike or spicate raceme. 3
- 2a. Inflorescence a panicle with simple (unbranched), spicate primary branches. 4
- 3. Plants perennial, with stout culms from a firm, rhizomatous base; leaf blades firm, usually 1.5 mm. or more broad. 6. *Pariana*
- 3a. Plants annual, with low, weak culms; leaf blades thin, 2-10 mm. broad. 51. *Antheophora*
- 4. Inflorescence branches digitate or in verticels at the culm apex. 5
- 4a. Inflorescence branches scattered on the culm. 9
- 5. Spikelets with a single perfect floret. 6
- 5a. Spikelets with 2-several perfect florets. 8
- 6. Rudimentary florets absent or represented by a minute scale; spikelets awnless. 24. *Cynodon*
- 6a. Rudimentary floret or florets present above the perfect one; spikelets with awned or mucronate lemmas. 7
- 7. Lemma of perfect floret conspicuously awned. 21. *Chloris*
- 7a. Lemma of perfect floret mucronate or minutely awned. 22. *Eustachys*
- 8. Lemma and glume awnless; rachis of inflorescence branch not projecting beyond terminal spikelet. 16. *Eleusine*
- 8a. Lemma and second glume short-awned; rachis of inflorescence branch projecting beyond terminal spikelet. 17. *Dactyloctenium*
- 9. Spikelets (lemmas) awned. 23. *Bouteloua*
- 9a. Spikelets awnless. 10
- 10. Spikelets with 2-several florets. 18. *Leptochloa*
- 10a. Spikelets with 1 floret. 25. *Spartina*

1. BAMBUSA Schreber

Bambusa Schreber, Gen. Pl. I: 236. 1789, nom. cons.

Arborescent or shrubby perennials with thick, short (pachymorphous) rhizomes and culms in clumps. Branches numerous at each node. Spikelets usually several-flowered, sessile, solitary or clustered. Glumes small. Lemmas firm, many-nerved, sharp-pointed or awn-tipped. Rachilla segments elongate, as much as half the length of the lemmas. Keels of palea projecting but not winged. Stamens 6. Lodicules 3. Fruit a caryopsis.

TYPE SPECIES: *Bambusa arundinacea* (Retz.) Willd., Sp. Pl. 2: 245. 1799. Retzius was the first author to recognize *Arundo bambos* L. as a genus. In raising this to generic level he took the epithet, *Bambos*, as the generic

5-15 cm. long and 7-10 cm. broad, subtriangular in outline, appressed-hairy on both surfaces, decurrent at base to 2 falcate auricles fringed with bristles. Ligules 5-6 mm. broad, toothed or fimbriate. Blades of culm branches linear-lanceolate, 15-25 cm. long, 1.6-4.0 cm. broad, with slender, twisted tips.

GENERAL DISTRIBUTION: Native to tropical Asia, widely introduced in tropical and subtropical regions of the world.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe, Martinique, Grenada.

HABITAT: Growing mainly as a planted ornamental.

3. *Bambusa glaucescens* (Willd.) Sieb. ex Munro in Trans. Linn. Soc. London 26: 89. 1868.

Basionym: *Ludolfia glaucescens* Willd. in Ges. Naturf. Freunde Berlin Mag. II: 320. 1808.

Type: India.

Evergreen shrub with culms 2-3 m. tall and 1.2-2.5 cm. in diameter. Culms much-branched from the base, smooth, at first green but later turning yellowish. Culm sheaths glabrous, green at first then yellow, 10-15 cm. long, 5.0-7.5 cm. broad, with a broadly rounded apex. Blade of culm leaf 5.0-7.5 cm. long, linear-acuminate, decurrent at base, glabrous or appressed-hairy above, hairy beneath, the margins ciliate with deciduous hairs. Ligule narrow, entire. Leaf sheaths smooth, striate, tipped with the callus, the auricles at the mouth fringed with a few stiff bristles. Ligule short. Blades narrow, linear-lanceolate, with a subulate tip, smooth above, glaucous or puberulous below, the nerves 3-6, with 7 or 8 intermediates, crossed by pellucid glands, the base rounded to a very short petiole.

GENERAL DISTRIBUTION: Natural distribution mainly the warmer regions of Japan, China, India, Sri Lanka, and other tropical areas of the Pacific.

DISTRIBUTION IN LESSER ANTILLES: Martinique, Riv. Madame, Tivoli, Stehlé 5868 (A).

HABITAT: Grown as an ornamental, apparently not established out of cultivation.

2. ARTHROSTYLIDIUM Ruprecht

***Arthrostylidium* Rupr., Bambuseae Monog. Exponit. 27, pl. IV. 1839.**

Unarmed woody perennials with self-supporting or viny culms from a pachymorphous rhizome system. Inflorescence a spicate raceme of subsessile spikelets, the inflorescences numerous and fascicled on the main culms. Inflorescence base bare of bracts or prophyllae. Spikelets few- to several-flowered, usually disarticulating between the florets, with short, pointed glumes, a sterile upper floret and often a greatly reduced lower floret. Stamens 3, stigmas 2, lodicules usually 3.

TYPE SPECIES: *Arthrostylidium cubense* Rupr. (Type designated by A. S. Hitchcock in Contr. U. S. Natl. Herb. 24: 307. 1927.)

McClure (in Smithsonian Contr. Bot. 9: 19, 20, 22. 1973) has discussed the close interrelationship of *Arthrostylidium* and *Arundinaria*. As delimited by McClure, there are 20 New World species of *Arthrostylidium* which are all endemic to regions of the New World with a mesophytic, tropical or subtropical climate. The geographical range of the genus is from Brazil and Venezuela through the Antilles to Cuba, with eight species known from Cuba.

KEY TO THE SPECIES

1. Rachis of inflorescence branch strongly zigzag; blades oblong-lanceolate, as much as 15 mm. broad. 1. *A. venezuelae*
- 1a. Rachis of inflorescence branch straight; blades linear-lanceolate, up to 12 mm. broad. 2. *A. obtusatum*

1. *Arthrostylidium venezuelae* (Steud.) McClure in Jour. Washington Acad. Sci. 32: 172. 1942.

Basionym: *Chusquea venezuela* Steud., Syn. Pl. Glum. 1: 337. 1854.

Type: Venezuela.

Syn: *Arthrostylidium excelsum* Griseb., Fl. Br. W. Ind. 529. 1864. (Type: *Crueger* 82, Trinidad.)

Arundinaria excelsa Hack. in Oesterr. Bot. Zeitschr. 53: 69, 516. 1903.

Culms viny, high climbing, with whorled branchlets 20–50 cm. long. Leaf blades mostly 8–12 cm. long and 12–15 mm. broad. Racemes with a strongly zigzag rachis, the spikelets divergent, 7–15 mm. long.

GENERAL DISTRIBUTION: Trinidad.

DISTRIBUTION IN LESSER ANTILLES: St. Kitts, Guadeloupe, Dominica, Martinique, St. Lucia and Grenada.

HABITAT: Forested areas.

Arthrostylidium excelsum is treated as a synonym of *A. venezuela*, at the suggestion of Dr. Thomas R. Soderstrom of the Smithsonian Institution. He noted that McClure also had arrived at the same conclusion but never formally included the name in synonymy.

2. *Arthrostylidium obtusatum* Pilger in Urban, Symb. Antill. 2: 340. 1901.

Type: *Duss* 563, 1310, Martinique, summit of Morne d'Amour.

Syn: *Arundinaria obtusata* (Pilger) Hack. in Oesterr. Bot. Zeitschr. 53: 69. 1903.

Habit not known but presumably viny. Blades glabrous, rather rigid, the larger as much as 8 mm. long and 12 mm. broad, those on branchlets smaller, tapering from base to apex, with an obtuse tip. Spikelets 12–20 mm. long, with 4 or 5 perfect florets and a straight or slightly zigzag

rachilla. Lemmas of perfect florets 8-9 mm. long, glabrous, several-nerved, obtuse at apex.

GENERAL DISTRIBUTION: Known only from Martinique.

DISTRIBUTION IN LESSER ANTILLES: Martinique, apparently known only from the type collections.

HABITAT: Forested areas.

3. PHARUS Linnaeus

Pharus L., Syst. Nat. ed. 10. 2: 1269. 1759.

FIGURE 8.

Monoecious perennials with erect herbaceous culms from an erect or decumbent base. Leaves with a petiolelike constriction between sheath and blade. Blades flat, broad, tapering to both ends, with fine transverse veinlets between the longitudinal nerves. Inflorescence a panicle of unisexual, 1-flowered spikelets, in pairs of one large, pistillate and sessile, and one small, staminate and long-pediceled, the spikelet pairs rather widely spaced and appressed along the unbranched or sparingly branched primary branches. Pistillate spikelets with thin, several-nerved, nearly equal glumes, these shorter than the lemma. Lemma densely pubescent with uncinata hairs at tip or all over, with a minute, bent beak, becoming indurate and inrolled over the caryopsis in fruit. Palea thin, long and narrow, 2-nerved. Stigmas 3. Staminate spikelets with thin glume, the first short, 1-nerved, the second about as long as the lemma, 3-nerved. Stamens 6.

TYPE SPECIES: *Pharus latifolius* L.

A genus of about eight species, with distribution from southern Florida and the West Indies to Brazil.

KEY TO THE SPECIES

1. Fruit 2 to 3 times as long as the glumes, pubescent all over; leaf blades commonly 3-5 cm. broad. 1. *P. glaber*
- 1a. Fruit slightly longer than the glumes, pubescent only at the tip; leaf blades commonly 5-8 cm. broad. 2. *P. latifolius*

1. *Pharus glaber* H.B.K., Nov. Gen. Sp. 1: 196. 1816.

Type: Venezuela.

Syn.: *Pharus lancifolius* Desv. in Hamilt., Prodr. 8. 1825.

Culms from an erect base, 50-75 cm. tall. Blades oblanceolate, acuminate, usually 15-25 cm. long and 3-5 cm. broad. Panicle branches few, stiffly spreading or ascending, strigose-pubescent. Pistillate spikelets slender, about 1 cm. long, the staminate spikelets mostly 3-5 mm. long. Glumes of both pistillate and staminate spikelets dark brown, darker than the brown or straw-colored lemmas of the pistillate spikelets. Spikelets readily

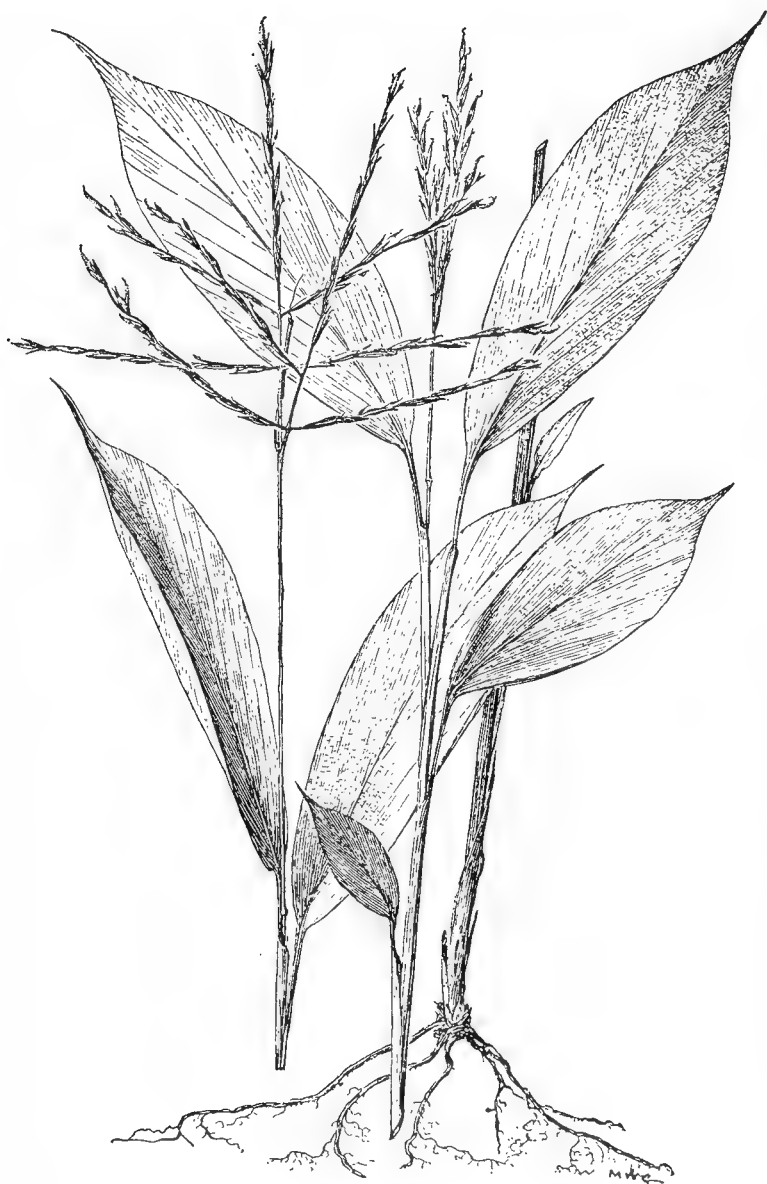


FIGURE 8. Poaceae. *Pharus latifolius*, $\times 0.5$. (Reprinted from Hitchcock, Manual of the grasses of the West Indies, p. 153, fig. 97. 1936.)

disarticulating at maturity, the fruits with their hooked hairs clinging to passing objects.

GENERAL DISTRIBUTION: Mexico and Brazil and in the Antilles.

DISTRIBUTION IN LESSER ANTILLES: Saba, St. Eustatius, St. Kitts, Montserrat, Marie Galante, Dominica, Martinique, St. Lucia, St. Vincent.

HABITAT: In "rich forest."

2. *Pharus latifolius* L., Syst. Nat. ed. 10. 2: 1269. 1759.

Type: Jamaica.

Syn.: *Pharus ovalifolius* Desv. in Hamilt., Prodr. 8. 1825.

Closely resembling *P. glaber* but differing mainly in the usually broader leaf blades, longer glumes and the less pubescent lemma. Hitchcock (Man. Grasses W. I. 152. 1936) noted, "similar to *P. glaber*, the blades on the average broader, the fruits longer, tapering at the summit, pubescent only near the tip." Many plants of *P. latifolius* have blades 6-8 cm. broad.

GENERAL DISTRIBUTION: Cuba to Trinidad and Central America to Brazil.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe, Martinique, Grenada.

HABITAT: In rich woods.

4. OLYRA Linnaeus

Olyra L., Syst. Nat. ed. 10. 2: 1261. 1759.

FIGURE 9.

Monoecious perennials with erect or twining, often woody culms and large, broad, flat blades. Inflorescence paniculate, with large pistillate spikelets borne on the upper branches and at the tips of the lower branches, and small, pediceled, staminate spikelets along the lower branches. First glume of pistillate spikelet lacking, the second glume and lemma of lower floret attenuate into awns, the glume much longer than the lemma. Lemma and palea of perfect floret hard and bony at maturity, the lemma with a conspicuous germination lid near its base. Staminate spikelets early deciduous, with glumes and lower floret completely reduced and absent. Lemma and palea of the staminate floret membranous.

TYPE SPECIES: *Olyra latifolia* L.

About 20 species of *Olyra* are recognized, these distributed in the American tropics and warmer regions of Africa.

1. *Olyra latifolia* L., Syst. Nat. ed. 10. 2: 1261. 1759.

Type: Jamaica.

Syn.: *Olyra paniculata* Sw., Prodr. 21. 1788.

Olyra latifolia var. *arundinacea* (H.B.K.) Griseb., Fl. Br. W. Ind. 535. 1864.



FIGURE 9. Poaceae. a-d, *Olyra latifolia*: a, habit, $\times 0.5$; b, pistillate spikelet, $\times 5$; c, staminate spikelet, $\times 5$; d, fertile floret, $\times 5$. (Reprinted from Hitchcock, Manual of the grasses of the United States, p. 738, fig. 1124. 1951.)

Culms stout, mostly 3-5 m. or more tall, the lower $\frac{1}{2}$ - $\frac{2}{3}$ unbranched and with greatly reduced, bladeless or nearly bladeless leaves, the upper portion with spreading, often fascicled branches to 1 m. long. Sheath with broad, auriculate apical margins. Blades glabrous, commonly 15-25 cm. long and 3-6 cm. broad, acuminate at apex, broad and asymmetrical below, abruptly contracted to a short, firm petiolelike base. Panicles 10-15 cm. long and about $\frac{2}{3}$ as broad at base, the stout primary branches each terminated by a single pistillate spikelet, the staminate spikelets borne on slender, appressed, often rebranched lateral branches. Pistillate spikelets with their long-attenuate and awned glumes mostly 2-3 cm. long. Fruit smooth, shiny, white (rarely black according to Grisebach, 1864), about 5 mm. long.

GENERAL DISTRIBUTION: Southern Mexico and Central America to northern South America and throughout the Antilles.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent and Grenada.

HABITAT: Shaded forest sites.

5. LITHACHNE Beauvois

Lithachne Beauv., Ess. Agrost. 135, pl. 24, f. 2. 1812. FIGURE 10.

Perennials with slender, wiry culms and unisexual spikelets, these mostly in few-flowered axillary racemes or panicles; occasionally a small terminal panicle of staminate spikelets produced. Axillary inflorescences with a single, large pistillate spikelet at the tip and 1-several small staminate spikelets on slender, appressed pedicels below. Glumes of pistillate spikelets large, membranous, acuminate. Lemma and palea of pistillate spikelet indurate and bony, asymmetrical, gibbous on the back. Staminate spikelets reduced to lemma, palea and stamens.

TYPE SPECIES: *Lithachne pauciflora* (Sw.) Beauv., based on *Olyra pauciflora* Sw.

A genus of three species found in the Caribbean, Central America and South America to Argentina.

1. *Lithachne pauciflora* (Sw.) Beauv. in Poir., in Dict. Sci. Nat. 27: 60. 1823.

Basionym: *Olyra pauciflora* Sw., Prodr. 21. 1788.

Type: Jamaica.

Syn.: *Olyra axillaris* Lam., Encycl. Méth. Bot. 4: 547. 1797.

Lithachne axillaris Beauv., Ess. Agrost. 166, pl. 24, f. 2. 1812.

Culms numerous from a firm base, 30-60 cm. tall, many-noded, little-branched above base except from the axillary racemes at the upper nodes. Sheaths with rounded, membranous, auriculate lobes at apex. Blades mostly 2-3 cm. broad and 7-10 cm. long, narrowly acute at apex, asym-



FIGURE 10. Poaceae. a-c, *Lithachne pauciflora*: a, habit, $\times 0.5$; b, glumes of pistillate spikelet, $\times 5$; c, floret of pistillate spikelet, $\times 5$. (Reprinted from Hitchcock, Manual of the grasses of the West Indies, p. 371, fig. 341. 1936.)

metrical and abruptly narrowed at base to a short petiolelike constriction, without a ligule but with a tuft of stiff, coarse hairs in its place. Staminate spikelets early deciduous. Pistillate spikelets with attenuate glumes mostly 0.7-2.0 cm. long and a smooth, bony, angular, shiny white grain 4-5 mm. long.

GENERAL DISTRIBUTION: Cuba south through the Caribbean, Mexico, Central America and eastern South America to Argentina.

DISTRIBUTION IN LESSER ANTILLES: Antigua, Guadeloupe, and Martinique.

HABITAT: In moist woods up to 2000 meters elevation.

6. PARIANA Aublet

Pariana Aubl., Pl. Guian. 2: 876, pl. 337. 1775.

Perennials with broad, flat blades and erect or creeping and stoloniferous culm bases. Inflorescence a short, dense spicate raceme, the spikelets whorled in clusters of 1 sessile and pistillate and 4-6 short-pediceled and staminate. Pedicels flattened and united by their winged margins. Spikelets 1-flowered, the pistillate with an indurate lemma and palea, the staminate with membranous glumes and lemmas.

TYPE SPECIES: *Pariana campestris* Aubl.

A genus of 30 to 35 species confined mainly to tropical South America, but one species (*P. zingiberina* Doell) reported from Costa Rica and Panama, and one (*P. silvestris*) from St. Vincent.

1. *Pariana silvestris* Nees, Agrost. Bras. 295. 1829.

Type: "In sylvis primaevis udis prope Para provinciae Paraensis, atique inter Cachias et Maragnanum, provinciae Maragnaniensis."

Leaf blades oblong to oblong-ovate, with a short, petiolelike constriction at base. Flowering shoots rhizomatous and branching at base, with leaves reduced to overlapping, acuminate sheaths. Pedicels pubescent, at least at base.

GENERAL DISTRIBUTION: Brazil.

DISTRIBUTION IN LESSER ANTILLES: St. Vincent.

HABITAT: In deep forest shade.

The only reference to *Pariana* in the Lesser Antilles is that of Grisebach (Fl. Br. W. Ind. 527, 528. 1864) who stated, "our specimen is devoid of leaves, presenting scapes, rooting at the branched base, covered almost to the summit with ventricose, acuminate sheaths: hence the determination of the species requires confirmation." Grisebach notes, "Hab. S. Vincent!, Guild. (perhaps introduced)."

7. ORYZA Linnaeus

Oryza L., Sp. Pl. 333. 1753.

FIGURE 11.

Annuals and herbaceous perennials with flat, linear or linear-lanceolate blades, and contracted or open terminal panicles of (apparently) 1-flowered spikelets. Ligules membranous. Spikelets laterally compressed, disarticulating at base. Lemma thick, firm, 5-nerved, awnless or awned. Palea 2-nerved, similar to the lemma in texture and tightly enclosing the caryopsis. Glumes apparently lacking, the two short, pointed bracts at base of lemma usually interpreted as reduced lemmas of rudimentary florets.

TYPE SPECIES: *Oryza sativa* L.

A genus of about 20 species, these widely distributed in moist, tropical and subtropical habitats of both the New and Old Worlds.

1. *Oryza sativa* L., Sp. Pl. 333. 1753.

Type: "Habitat forte in Aethiopia, colitur in India paludosis."

Cespitose annual with succulent, glabrous culms mostly 80-160 cm. tall in small clusters or clumps. Sheaths glabrous or the lowermost sparsely hirsute, usually with well-developed auricles. Ligules large, thick, 2-lobed. Blades glabrous 0.7-2.0 cm. broad. Inflorescence a somewhat contracted, drooping panicle of large, 1-flowered spikelets. Spikelets mostly 7-10 mm. long. Lemmas awnless or with a stout awn.

GENERAL DISTRIBUTION: Cultivated throughout the warm regions of the world.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe, Martinique, St. Vincent, Barbados. Herbarium records of cultivated rice undoubtedly provide a very incomplete record of its occurrence in the Lesser Antilles.

HABITAT: As a crop plant, mostly grown under irrigation and periodic flooding; as an escape, growing in wet, marshy habitats.

8. LEERSIA Swartz

Leersia Sw., Prodr. 21. 1788, nom. cons.

FIGURE 12.

Tufted perennials, mostly rhizomatous, with flat, linear leaf blades and open or loosely contracted panicles of 1-flowered, awnless spikelets. Ligules membranous, firm. Spikelets laterally compressed, subsessile and in most species crowded on the upper branchlets of the panicle. Glumes absent. Lemmas firm or indurate, boat-shaped, usually 5-nerved, tightly enclosing the margins of a firm, narrow, laterally compressed, 3-nerved palea. Stamens varying in number from 1-6.

TYPE SPECIES: *Leersia oryzoides* (L.) Sw., based on *Phalaris oryzoides* L., typ. cons.



FIGURE 11. Poaceae. a-c, *Oryza sativa*: a, b, base, culm and inflorescence, $\times 0.5$; c, spikelet, $\times 5$. (Reprinted from Hitchcock, Manual of the grasses of the West Indies, p. 146, fig. 92. 1936.)



FIGURE 12. Poaceae. a, b, *Leersia hexandra*: a, habit, $\times 0.3$; b, spikelet, $\times 10$.
(Reprinted from Gould, Grasses of the Texas Coastal Bend, p. 88, fig. 84. 1965.)

Species about ten, in moist or wet habitats of temperate and tropical regions of both hemispheres.

KEY TO THE SPECIES

1. Spikelets 3.0-3.5 mm. long; panicle contracted, the branches stiffly erect, floriferous to near the base. 1. *L. hexandra*
- 1a. Spikelets 1.0-2.5 mm. long; panicle open, the branches slender and spreading, bare of spikelets below. 2
2. Spikelets 2.0-2.5 mm. long; leaf blades 1-2 mm. broad. 2. *L. grandiflora*
- 2a. Spikelets 1.3-1.9 mm. long; leaf blades 2-5(-6) mm. broad. 3. *L. monandra*

1. *Leersia hexandra* Sw., Prodr. 21. 1788.

Type: Jamaica.

Syn.: *Homalocenchrus hexandrus* (Sw.) O. Ktze., Rev. Gen. Pl. 2: 777. 1891.

Oryza hexandra (Sw.) Doell in Mart., Fl. Bras. 2(2): 10. 1871.

Plants with decumbent or creeping vegetative shoots and erect, floriferous culms from scaly rhizomes. Culms mostly 50-100 cm. tall, with minutely retrorsely hispid nodes. Leaves usually scabrous on both sheath and blade. Ligules truncate or acute. Blades thin but stiff, 3-7 mm. broad. Panicles loosely contracted, 5-10 cm. long, with branches mostly 1.5-3.0 cm. long, the branches spikelet-bearing nearly to the base. Spikelets 3.2-4.5 mm. long and 1.0-1.5 mm. broad, the lemma and palea bristly-ciliate on the keel.

GENERAL DISTRIBUTION: Widely distributed in the tropics and subtropics of both hemispheres.

DISTRIBUTION IN LESSER ANTILLES: Reported by Stehlé from Guadeloupe and Martinique.

HABITAT: In moist or wet soils along rivers, lakes and marshy areas.

2. *Leersia grandiflora* (Doell) Prodoehl in Bot. Arch. Mez 1: 219. 1922.

Basionym: *Oryza monandra* Doell var. *grandiflora* Doell in Mart., Fl. Bras. 2(2): 9. 1871.

Type: Brazil.

Syn.: *Homalocenchrus grandiflorus* (Doell) Hitchc. in Contr. U. S. Natl. Herb. 17: 273. 1913.

Culms slender, tufted, without creeping rhizomes at base, mostly 1-2 m. tall. Sheath apex continued as a firm, truncate, fimbriate ligule. Blades elongate, 0.7-2.0 mm. broad, sparsely hispid on adaxial surface near base. Panicles up to 25 cm. or more long, with slender primary branches mostly 10-15 cm. long, these bare of spikelets on the lower $\frac{1}{2}$ or $\frac{2}{3}$, the spikelets mostly crowded at the branch tips and on short branchlets. Spikelets sharply keeled and laterally flattened, 2.0-2.5 mm. long and about 1.5 mm. broad, coarsely scabrous.

GENERAL DISTRIBUTION: Eastern Mexico, Central America and Brazil.

DISTRIBUTION IN LESSER ANTILLES: Reported by Hitchcock from Guadeloupe (*Duss* 3146) and Martinique (*Duss* 775).

HABITAT: Moist or marshy areas along streams and lakes.

3. *Leersia monandra* Sw., Prodr. 21. 1788.

Type: Jamaica.

Syn.: *Paspalum cubense* Spreng., Neue Entdeck. 3: 12. 1822. (Type: Cuba.)

Oryza monandra Doell in Mart., Fl. Bras. 2(2) : 9. 1871.

Homalocenchrus monandrus Kuntze, Rev. Gen. Pl. 2: 777. 1891.

Tufted perennial with stiffly erect, slender culms 40–100 cm. tall. Culm nodes appressed-hairy. Sheaths hairy on collar, otherwise glabrous or scabrous. Ligules membranous, firm, divided and lacerate at apex, mostly 1–3 mm. long. Blades flat, linear, acuminate, 6–18 cm. long, 2–5(–6) mm. broad, glabrous or scabrous. Panicles 5–15 cm. long, with small spikelets closely imbricate at the tips of long, slender, widely spaced, stiffly spreading, capillary branches. Spikelets 1.3–1.9 mm. long, broadly ovate, glabrous.

GENERAL DISTRIBUTION: The Antilles and Florida to Texas and south to Brazil.

DISTRIBUTION IN LESSER ANTILLES: Martinique (*Duss* 774, 775).

HABITAT: Moist, usually shady habitats, commonly in rocky woodlands.

9. LUZIOLA Jussieu

Luziola Juss. in Gmel., Syst. Nat. ed. 13. 2: 637. 1791.

Low, weak-stemmed perennials (some annual ?) with small panicles of 1-flowered, unisexual spikelets. Ligule membranous, large. Pistillate and staminate spikelets in the same inflorescence or more often in separate inflorescences on the same plant, the staminate usually terminal, the pistillate at the middle and upper culm nodes. Disarticulation below the spikelet. Glumes absent. Lemma and palea about equal, thin, several- to many-nerved. Caryopsis globose or oblong, smooth or striate. Stamens usually 6.

TYPE SPECIES: *Luziola peruviana* Gmel.

A genus of eleven species (Swallen in Ann. Missouri Bot. Gard. 52: 472–475. 1965) found in tropical and subtropical regions of the New World.

1. *Luziola subintegra* Swallen in Ann. Missouri Bot. Gard. 30: 164, 165. 1943.

Type: *Bartlett & Lasser* 16816, Canal Zone, floating in Chagres River at Juan Mina.

Aquatic perennial with rather thick succulent culms, these rooting at the nodes. Sheaths loose, inflated, glabrous, auriculate, the thin auricles fused with the ligule, attenuate to fine points, 1-8 cm. long. Blades elongate, 1.0-2.5 cm. broad, gradually narrowed below to a thick base. Staminate panicles 12-15 cm. long, with slender, ascending to spreading branches. Staminate spikelets about 6 mm. long. Pistillate inflorescence partially included in the sheath, 5-6 cm. long and about as broad, with numerous stiffly ascending or spreading branches each terminating in a spikelet. Pistillate spikelets 4-5 mm. long, narrow, acuminate, pale. Caryopsis about 2 mm. long, subspherical, minutely striate.

GENERAL DISTRIBUTION: Apparently known only from the type locality in the Panama Canal Zone and from St. Vincent.

DISTRIBUTION IN LESSER ANTILLES: St. Vincent, Malice Pt., *Howard, Cooley & Weaver 17826* (A).

HABITAT: In swamp or marsh areas, the culms commonly floating.

10. ORTHOCLADA Beauvois

Orthoclada Beauv., Ess. Agrost. 69, *pl. 14, f. 9*. 1812. FIGURE 13.

Broad-leaved perennial with large, open panicle of 1- to 2-flowered, awnless or short-awned spikelets.

TYPE SPECIES: *Orthoclada laxa* (L. Rich.) Beauv., based on *Aira laxa* L. Rich.

A genus of two species, one in the New World tropics and one in Africa.

1. *Orthoclada laxa* (L. Rich.) Beauv., Ess. Agrost. 70, 149, 168. 1812.

Basionym: *Aira laxa* L. Rich. in Acta Soc. Hist. Nat. Paris 1: 106. 1792.

Type: French Guiana, Cayenne.

Syn.: *Panicum rariflorum* Lam., Encycl. Méth. Bot. 4: 746. 1798.

Orthoclada rariflora (Lam.) Beauv., Ess. Agrost. 70, *pl. 14, f. 9*. 1812.

Culms commonly 1 m. tall, usually unbranched above base. Sheaths scabrous-pubescent, abruptly narrowing to petiolelike base of blade. Blades flat, minutely cross-veined (reticulate), mostly 12-15 cm. long and 2.0-2.5 cm. broad, with a petiolelike constriction 1-2 cm. or more long at base. Panicle usually 20 cm. or more long and about as broad, with one to few spikelets short-pedicel at and near the tips of long, slender, erect or stiffly spreading branches. Spikelets 1-flowered with a prolongation of the rachilla or 2-flowered, mostly 5-8 mm. long. Glumes narrowly acute, 3- to 5-nerved, about equal or the first slightly shorter than the second, mostly 4-5 mm. long. Lemma often minutely awn-tipped, slightly longer than the firm palea.

GENERAL DISTRIBUTION: Southern Mexico, Central America south to Brazil and Peru, and also Trinidad.



FIGURE 13. Poaceae. *Orthoclada laxa*, $\times 0.5$. (Reprinted from Hitchcock, Manual of the grasses of the West Indies, p. 57, fig. 31. 1936.)

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe (*Duss 3522*), Martinique (*Stehlé 4615*), and St. Vincent.

HABITAT: In deep shade of forests.

11. ARUNDO Linneaus

Arundo L., Sp. Pl. 81. 1753.

FIGURE 14.

Rhizomatous perennials with tall, stout culms, long broad blades, and large plumose panicles. Spikelets with several florets, the upper often reduced. Glumes large, thin, 3-nerved, tapering to a slender point or short awn. Palea thin, 2-keeled.

TYPE SPECIES: *Arundo donax* L.

Species about six, all native to the Old World.

1. *Arundo donax* L., Sp. Pl. 81. 1753.

Type: Europe.

Culms mostly 2-6 m. tall, commonly forming large clumps from hard, knotty rhizomes. Herbage glabrous. Leaves rather uniformly spaced and distichous on the culms. Ligule a ciliate membrane 1 mm. or less long. Blades thick and firm, mostly 4-7 cm. broad on the main culms. Inflorescence densely flowered, 30-60 cm. long, with numerous stiffly erect-spreading primary branches. Spikelets mostly 2- to 4-flowered, 10-15 mm. long, with short, glabrous rachilla joints. Lemmas thin, 3- to 5-nerved, 5-10 mm. long, densely pilose with soft hairs 6-9 mm. long.

GENERAL DISTRIBUTION: Native to the warmer parts of Europe and Asia but now widespread throughout temperate and subtropical regions of the world.

DISTRIBUTION IN LESSER ANTILLES: Dominica, Martinique, St. Lucia. *Duss* made collections on Guadeloupe and *Velez* reports records from St. Martin, Antigua, St. Kitts, Montserrat, Guadeloupe, Martinique, St. Vincent, Grenada and Barbados.

HABITAT: In moist soil of ditches, swales and river banks.

12. PHRAGMITES Adanson

Phragmites Adans., Fam. Pl. 2: 34, 559. 1763.

FIGURE 15.

Tall perennial reed grasses with large linear leaves and large terminal panicles. Spikelets several-flowered, disarticulating above the glumes and between the florets. Lower floret staminate or neuter, the terminal floret also reduced. Glumes and lemmas thin, acute or acuminate, glabrous. Rachilla villous with long hairs.

TYPE SPECIES: *Arundo phragmites* L., now correctly known as *Phragmites australis* (Cav.) Trin. ex Steud.



FIGURE 14. Poaceae. a-d, *Arundo donax*: a, rhizome, $\times 0.3$; b, culm, $\times 0.3$; c, inflorescence, $\times 0.3$; d, spikelet, $\times 3$; e, floret, $\times 3$. (Reprinted from Hitchcock, Manual of the grasses of the United States, p. 188, fig. 251. 1951.)

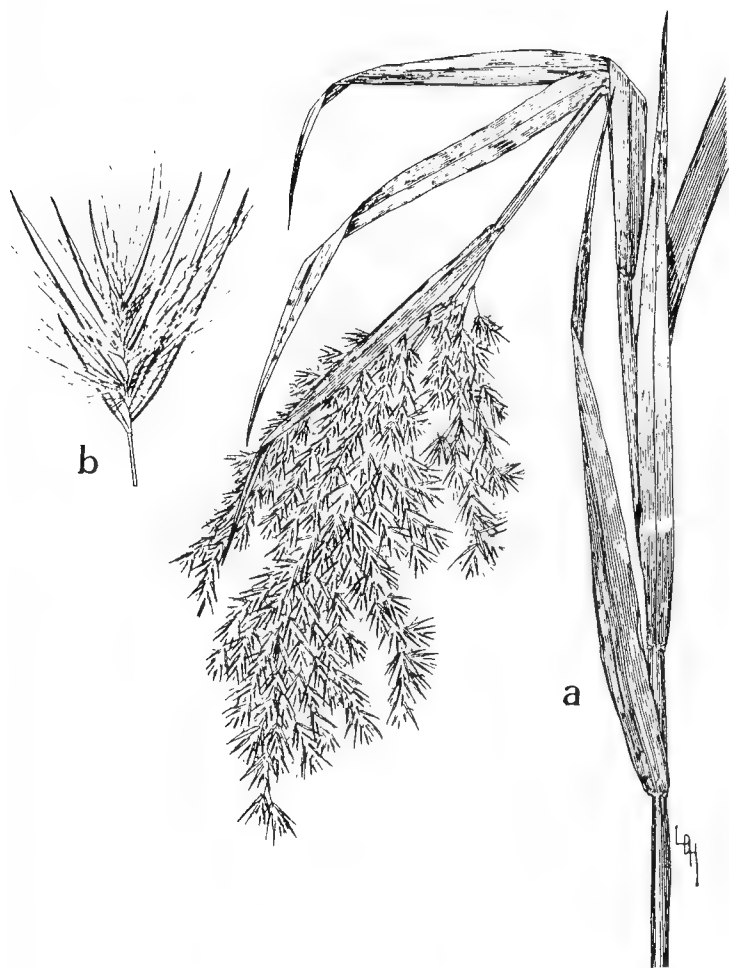


FIGURE 15. Poaceae. a, b, *Phragmites australis*: a, inflorescence, $\times 0.3$; b, spikelet, $\times 5$. (Reprinted from Gould, Common Texas Grasses, p. 193, fig. 117. 1978.)

A genus of three species, one in Asia, one in Argentina, and one widespread throughout temperate and tropical regions of the world.

1. **Phragmites australis** (Cav.) Trin. ex Steud., Nom. Bot. ed. 2. 2: 324. 1841.

Basionym: *Arundo australis* Cav. in Anal. Hist. Nat. (Madrid) 1: 100. 1799.

Type: Australia.

Syn.: *Arundo phragmites* L., Sp. Pl. 81. 1753.

Phragmites communis Trin., Fund. Agrost. 134. 1820.

Culms 2-4 m. tall from thick, creeping rhizomes. Culms and leaves glabrous. Lingule minute, ciliate, the hairs longer than the membranous base. Blades of main culms mostly 1.5-5.0 cm. broad. Panicle large, much-branched but contracted, the spikelets on slender wiry pedicels and branchlets. Spikelets 10-15 mm. long, mostly with 4-8 florets. Rachilla joints villous with hairs 1 cm. or more long, the glumes and lemmas glabrous. First glume 3-nerved, $\frac{1}{2}$ - $\frac{2}{3}$ as long as the second. Second glume mostly 6-8 mm. long, 3-5-nerved. Lemma of the lower (infertile) floret mostly 11-14 mm. long, much longer than the lemmas of the upper florets.

GENERAL DISTRIBUTION: Widespread in temperate and tropical regions of the world.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe, Martinique and St. Lucia.

HABITAT: Mostly in wet sites along marshy areas and streamcourses.

The collection *Duss 1283* from Martinique was identified as *Phragmites martinicense* Trin. ex Steud., a nomen nudum.

13. **GYNERIUM** Willdenow ex Beauvois

Gynerium Willd. ex Beauv., Ess. Agrost. 138, pl. 26, f. 6. 1812.

FIGURE 16.

Perennial reedgrass with thick rhizomes and tall, stout culms. Blades firm, long, linear. Inflorescence a densely flowered panicle 1 m. or more long, the pistillate panicles silky-villous, the staminate panicles glabrous. Both staminate and pistillate spikelets 2-flowered.

TYPE SPECIES: *Gynerium sagittatum* (Aubl.) Beauv., based on *Saccharum sagittatum* Aubl.

A monotypic, dioecious genus of tropical America.

1. **Gynerium sagittatum** (Aubl.) Beauv., Ess. Agrost. 138, pl. 26, f. 6. 1812.

Basionym: *Saccharum sagittatum* Aubl., Pl. Guian. 1: 50. 1775.

Type: French Guiana.

Syn.: *Arundo saccharoides* Poir. in Lam., Encycl. Méth. Bot. Suppl. 4: 703. 1816.

Aira gigantea Steud., Syn. Pl. Glum. 1: 224. 1854.



FIGURE 16. Poaceae. a-d, *Gynierium sagittatum*: a, habit, much reduced; b, culm with imbricate sheaths, $\times 0.5$; c, staminate branch, $\times 1$; d, pistillate branch, $\times 1$. (Reprinted from Hitchcock, Manual of the grasses of the West Indies, p. 50, fig. 26. 1936.)

Culms up to 10 m. tall, the older culms covered by closely imbricated, smooth, rounded sheaths from which the blades have fallen. Ligule a minute fringed membrane. Blades commonly 1-2 m. long and 3-6 cm. broad, with sharply serrulate margins. Staminate spikelets with large, narrowly acute or acuminate, silvery, 1-nerved glumes of unequal length and lemmas similar in texture to the glumes but longer. Pistillate spikelets with thin, long-attenuate, glabrous, purple-tinged glumes, the second much longer than the first, and thin, long-attenuate, purple-tinged lemmas that are silky-villous with silvery hairs 0.5-1.0 cm. or more long.

GENERAL DISTRIBUTION: Throughout the West Indies except the Bahamas, and in southern Mexico, Central America and South America to Paraguay.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe, Dominica, Martinique, St. Lucia, Grenada.

HABITAT: Forming dense thickets on river banks and low ground.

14. VULPIA K. C. Gmelin

Vulpia K. C. Gmelin, Fl. Baden. 1: 8. 1805.

Plants characteristically annual and short-lived, with weak, erect or decumbent culms that branch only or mainly at the base. Ligule a short membrane. Blades thin, narrow, flat or loosely involute. Inflorescence a narrow panicle or spicate raceme, the branches stiffly erect-spreading or appressed. Spikelets with (1-)2-17 florets. Glumes subulate, the first 1-nerved, the second 3-nerved. Lemmas 5-nerved, acute to acuminate, awned or awnless. Stamens 1 or occasionally 3 in chasmogamous plants.

TYPE SPECIES: *Vulpia myuros* (L.) K. C. Gmel., based on *Festuca myuros* L.

A genus of about 25 species native to temperate and subtropical regions of Europe, the Mediterranean region, and North and South America; a few species introduced into Asia and Australia. *Vulpia* was not recognized as distinct from *Festuca* by Hitchcock, who reported two (introduced) species in the West Indies (Man. Grasses W. I. 26. 1936). As reported by Lonard & Gould (in Madroño 22: 220.1974) the separation of *Vulpia* from *Festuca* is based on a number of characters. With few exceptions, the species of *Vulpia* are short-lived annuals, whereas those of *Festuca* are strong perennials. Typically the anthers of *Vulpia* are less than 0.5 mm. long and the plants are cleistogamous. In *Festuca* the anthers are 3 mm. or more long and the plants are chasmogamous. In contrast to the "weedy" nature of most vulpias, the festucas primarily are meadow and pasture grasses of economic importance.

1. *Vulpia myuros* (L.) K. C. Gmel., Fl. Baden. 1: 8. 1805.

Basionym: *Festuca myuros* L., Sp. Pl. 74. 1753.

Type: "Habitat in Anglia [England], Italia."

Culms solitary or loosely tufted, 10-60(-90) cm. tall. Sheaths glabrous or the lowermost puberulent, broadly rounded or lobed laterally at apex, abruptly narrowing to a fimbriate ligule less than 0.5 mm. long. Blades mostly 15 cm. or less long and 0.5-3.0 mm. broad. Inflorescence 3-25 cm. long, with erect-appressed or drooping branches. Spikelets 5.5-12.0 mm. long excluding the awns, with 3-7 florets. Lemma of lowermost floret usually scabrous, 4.5-7.0 mm. long, with an awn 7.5-22.0 mm. long. Palea as long as lemma, colorless. Caryopsis 3.0-4.5 mm. long.

GENERAL DISTRIBUTION: Probably native to central Europe, now widely dispersed throughout southern Europe, Africa, Asia, Australia and North and South America.

DISTRIBUTION IN LESSER ANTILLES: Reported from St. Eustatius by Boldingh.

HABITAT: A weed of roadsides, vacant lots and wastelands.

15. ERAGROSTIS von Wolf

Eragrostis von Wolf, Gen. Plant. Vocab. Charat. Delfin. 23. 1776.

FIGURE 17.

Tufted annuals and perennials, some with rhizomes. Ligules ciliate. Inflorescence an open or less frequently a contracted panicle. Spikelets (2- or) 3- to many-flowered, disarticulating above the glumes but in some species the panicle breaking off at the base at maturity and spreading seed as a tumbleweed. Lemmas usually membranous, 3-nerved. Paleas commonly ciliate on the two prominent keels, bowed out by the mature grain, often persisting on the rachilla after the grain, lemma and glumes have fallen. Grain variable in shape, typically reddish-brown and translucent.

TYPE SPECIES: *Poa eragrostis* L., now correctly known as *Eragrostis minor* Host.

A widely distributed genus of some 250 species, found in tropical and temperate regions of the world. About half of the species are weedy annuals.

KEY TO THE SPECIES

1. Plants annual, with slender culms mostly 5-60 cm. tall. 2
- 1a. Plants perennial, or if annual then with stout culms usually 1-2 m. tall. . . 8
2. Paleas ciliate on the nerves. 3
- 2a. Paleas glabrous or scabrous on the nerves. 4
3. Panicle contracted, with short, erect-appressed branches; pedicels mostly shorter than the spikelets; palea cilia 0.4-0.8 mm. long. 1. *E. ciliaris*
- 3a. Panicle open, oblong; pedicels mostly as long as or longer than the spikelets; palea cilia 0.2-0.4 mm. long. 2. *E. tenella*
4. Plants not stoloniferous and mat-forming, mostly 10-60 cm. tall. 5
- 4a. Plants stoloniferous and mat-forming, mostly 10-25 cm. tall. 3. *E. hypnoides*
5. Lemmas glandular on the keeled midnerve. 4. *E. cilianensis*



FIGURE 17. Poaceae. a-c, *Eragrostis cilianensis*: a, habit, $\times 0.5$; b, spikelet, $\times 5$; c, floret, $\times 10$. (Reprinted from Hitchcock, Manual of the grasses of the West Indies, p. 38, fig. 16. 1936.)

- 5a. Lemmas not glandular on the keeled or rounded midnerve. 6
- 6. Inflorescence more or less open, the branches not densely flowered to the base; pedicels mostly 3-5 mm. or more long. 7
- 6a. Inflorescence contracted, the branches mostly densely flowered to the base; pedicels 1 mm. or less long. 7. *E. glomerata*
- 7. Pedicels mostly or all longer than the spikelets, the latter spreading at maturity; spikelets 0.7-1.2 mm. broad. 5. *E. pilosa*
- 7a. Pedicels, at least those of the lateral spikelets, shorter than the spikelets, the spikelets tending to be appressed along the branches, mostly 1.5-2.0 mm. broad. 6. *E. tephrosanthes*
- 8. Panicle branches, at least the lower ones, with tufts of hair in their axils; lemmas narrowly acute to acuminate, 2.0-3.0 mm. long. . . . 8. *E. acutiflora*
- 8a. Panicle branches glabrous in their axils or the axils infrequently with a few long hairs; lemmas acute, 2 mm. or less long. 9
- 9. Panicles densely flowered with small, closely placed spikelets; spikelets 2-6 mm. long, mostly on pedicels 1 mm. or less long. 7. *E. glomerata*
- 9a. Panicles not densely flowered; spikelets 5-10 mm. long, on pedicels mostly 3-7 mm. or more long. 10
- 10. Panicle branches flexuous, spreading, the panicle about $\frac{2}{3}$ as wide as long; spikelets dark purple at maturity, with the lateral nerves of the lemma obscure. 9. *E. purpurascens*
- 10a. Panicle branches erect or erect-spreading, not flexuous, the panicle much less than $\frac{2}{3}$ as wide as long; spikelets green or slightly purple, the lateral nerves of the lemma well developed. 10. *E. prolifera*

1. *Eragrostis ciliaris* (L.) R. Br. in Tuckey, Narr. Exped. Riv. Zaire 478. 1818.

Basionym: *Poa ciliaris* L., Syst. Nat. ed. 10. 2: 875. 1759.

Type: Jamaica.

Syn.: *Poa elegans* Poir. in Lam., Encycl. Méth. Bot. 5: 87. 1804. (Type: Puerto Rico, "recueillie par le citoyen Ledru a Porto Ricco (V.s. in *Herb. Lam.*).")

Tufted annual with weak, often geniculate-spreading culms 15-40 cm. long. Sheaths often with a few long hairs on upper margins. Ligule not well defined, the ligular area and lower adaxial surface of blade often sparsely long-hairy. Blades thin, flat or folded, 1-3(-4)mm. broad. Inflorescence narrow, contracted, densely flowered, mostly 3-10(-15) cm. long and 5-7(rarely to 10) mm. thick. Spikelets subsessile, mostly 6-9(-14)-flowered and 2.0-2.5 mm. long. Glumes 1-nerved, acute, scabrous on the nerve, equal or nearly so, shorter than the lemmas. Lemmas averaging about 1 mm. long, glabrous or scaberulous. Paleas long-ciliate with pustula-based hairs on the nerves.

GENERAL DISTRIBUTION: Widespread in the warmer regions of the world, apparently introduced in the Americas.

DISTRIBUTION IN LESSER ANTILLES: Anguilla, St. Martin, Saba, St. Eustatius, St. Kitts, Montserrat, Redonda, Guadeloupe, Marie Galante, Dominica, Martinique, St. Lucia, St. Vincent, the Grenadines, Grenada, Barbados.

HABITAT: Open sandy sites, frequent at low elevations along the ocean and a common weed of city lots and waste areas.

2. *Eragrostis tenella* (L.) Beauv. ex Roem. & Schult., Syst. Veg. ed. nov. 2: 576. 1817.

Basionym: *Poa tenella* L., Sp. Pl. 69. 1753.

Type: India.

Syn.: *Poa amabilis* L., Sp. Pl. 68. 1753. (Type: India.)

Eragrostis amabilis (L.) Wight & Arn. in Hook. & Arn., Bot. Beechey Voy. 251. 1841.

Poa plumosa Retz., Obs. Bot. 4: 20. 1786. (Type: India.)

Eragrostis plumosa (Retz.) Link, Hort. Berol. 1: 192. 1827.

Tufted annual with slender, weak, often geniculately spreading culms mostly 10-20(-35) cm. tall. Sheaths glabrous or with a few long hairs at apex. Ligule a ring of short hairs. Blades thin, flat, 1-5 mm. broad, often with a few long hairs on adaxial surface just above ligule. Inflorescence open but narrow, 4-9 cm. long and 1.5-3.0 cm. thick, with numerous short, freely rebranched spreading branches. Spikelets usually 3- to 8-flowered, about 2 mm. long, on well-developed, often long pedicels. Glumes acute, somewhat unequal, the second about as long as the lowermost lemma, the first shorter. Lemmas about 1 mm. long, glabrous, acute to obtuse at apex.

GENERAL DISTRIBUTION: Widely distributed in the warmer parts of both hemispheres; native to the Old World. Frequent throughout the Caribbean and in coastal areas of southern North America and Central America.

DISTRIBUTION IN LESSER ANTILLES: St. Barthelemy, Antigua, St. Kitts, Montserrat, Guadeloupe, Martinique, St. Lucia, Grenada.

HABITAT: Frequent in sandy soils at low elevations.

3. *Eragrostis hypnoides* (Lam.) B. S. P., Prel. Cat. N. Y. 69. 1888.

Basionym: *Poa hypnoides* Lam., Tabl. Encycl. Méth. Bot. 1: 185. 1791.

Type: "Ex America merid. Comm. D. Richard."

Syn.: *Poa carinata* Poir. in Lam., Encycl. Méth. Bot. 5: 86. 1804. (Type: Puerto Rico: "Cette plante croît à Porto-Ricco, où elle a été observée par le citoyen Ledru. (V.s. in herb. Lam.).")

Low, creeping annual with much-branched, decumbent-spreading culms, the erect, floriferous shoots 10-25 cm. tall. Sheaths much shorter than culm internodes, often with a ring of hairs at base and soft hairs at throat. Blades thin, flat or loosely infolded, 0.5-2.5 cm. long, 0.5-1.5 mm. broad. Inflorescence a short, dense, almost capitate, few-flowered panicle 2-5 cm. long and 1.0-3.5 cm. thick. Spikelets short-pedicel on the main axis or short branches, lanceolate to narrowly ovate, laterally compressed, 5-12 mm. long, 1.5-2.5 mm. broad, 8- to 20(to 40)-flowered, the rachilla persistent. Glumes acute, unequal, shorter than the lemmas. Lemmas 1.8-2.0 mm. long and about 1 mm. broad. Anthers mostly 0.3-0.6 mm. long.

GENERAL DISTRIBUTION: Scattered localities throughout the United States and Mexico south to Brazil.

DISTRIBUTION IN LESSER ANTILLES: Martinique, *Duss 793b*. Duss identified this collection as *Eragrostis reptans* (Michx.) Nees (*Neerogrostis reptans* (Michx.) Nicora); however, the present writer has examined the specimen and determined it clearly to be *E. hypnoides*.

HABITAT: Low, moist areas, often developing along drying grassy swales or shallow lakes.

4. *Eragrostis cilianensis* (All.) E. Mosher in Ill. Agr. Exp. Sta. Bull. 205: 381. 1918.

Basionym: *Poa cilianensis* All., Fl. Pedemont. 2: 246. 1785.

Type: Europe.

Syn.: *Eragrostis major* Host, Icon. Gram. Austr. 4: 14, pl. 24. 1809.

Eragrostis megastachya (Koel.) Link, Hort. Berol. 1: 187. 1827, based on *Poa megastachya* Koel. (Type: Europe.)

Tufted, weak-stemmed annual with culms mostly 10-60 cm. tall. Culms usually with a ring of glandular tissue below the nodes. Sheaths glabrous except the pilose throat, usually with glandular pits in the keel. Blades flat or folded, glabrous, 10-20 cm. long and 2.5-7.0 mm. broad. Panicles ovate to oblong, densely flowered to open, 5.5-16.0 cm. long, 2.0-8.5 cm. thick. Spikelets short-pedicel, 6-20 mm. long, 2-4 mm. broad, 12- to 40-flowered, with a persistent rachilla. Glumes broadly to narrowly ovate, acute, nearly equal and slightly shorter than the lemmas, often with glandular pits on the keel. Lemmas closely imbricate, grayish-green, ovate, acute to obtuse, 2.2-2.8 mm. long, usually glandular-pitted on the mid-nerve. Paleas thin, ciliolate on keels, persistent. Grains 0.5-0.8 mm. long.

GENERAL DISTRIBUTION: Native to Europe, now widespread and weedy in the United States, Mexico and Central America and occasional in the Caribbean and South America.

DISTRIBUTION IN LESSER ANTILLES: No specific records from the Lesser Antilles are known; however, this weedy annual is to be expected.

HABITAT: Usually in moist, disturbed soils, often in ditches and on roadsides.

5. *Eragrostis pilosa* (L.) Beauv., Ess. Agrost. 162. 1812.

Basionym: *Poa pilosa* L., Sp. Pl. 68. 1753.

Type: Europe.

Tufted annual with culms in small clumps. Culms slender and weak, 10-50 cm. tall. Sheaths usually with lateral tufts of long hair at apex. Blades flat, 1-3 mm. broad. Panicle open, rather delicate, 5-20 cm. long and 2-8 cm. wide. Spikelets gray to nearly black, mostly 3.5-5.0 mm. long and 0.7-1.0 mm. broad, at maturity spreading on slender pedicels usually

as long as or longer than the spikelets. Glumes unequal, the second about 1 mm. long, the first shorter. Florets mostly 3-6(-9) per spikelet, the lemmas thin, 1.2-1.5 mm. long, obscurely 3-nerved.

GENERAL DISTRIBUTION: Throughout the warmer regions of the world.

DISTRIBUTION IN LESSER ANTILLES: Antigua, St. Kitts, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Grenada, Barbados. Boldingh (1909) also reported this species from St. Martin and Saba.

HABITAT: A weed of open fields, roadsides and wasteplaces.

6. *Eragrostis tephrosanthes* Schult., Mant. 2: 316. 1824.

Type: Martinique.

Tufted annual, generally similar to *E. pilosa* but with spikelets typically on shorter pedicels and tending to be appressed along the panicle branches. In *E. tephrosanthes*, the spikelets are 6- to 12-flowered, 4-7 mm. long and 1.5-2.0 mm. broad.

GENERAL DISTRIBUTION: The Bahamas and Cuba south to Brazil.

DISTRIBUTION IN LESSER ANTILLES: Saba, St. Kitts, Martinique, St. Vincent, Grenada, Barbados.

HABITAT: Open ground, usually in disturbed soils, of fields and wasteplaces.

Grisebach (1864) referred this species to *E. poaeoides* Beauv., but did not report records from the Lesser Antilles.

7. *Eragrostis glomerata* (Walt.) L. H. Dewey in Contr. U. S. Natl. Herb. 2: 543. 1894.

Basionym: *Poa glomerata* Walt., Fl. Carol. 80. 1788.

Type: South Carolina.

Coarse annual with culms mostly 30-90 cm. tall, but those of depauperate plants much shorter. Herbage glabrous. Ligule a short, membranous rim. Blades thin, flat, elongate, mostly 2-6 mm. broad. Panicles up to 40 cm. long, narrow, loosely contracted, with numerous short, stiffly erect-spreading, densely flowered branches. Spikelets 2-6 mm. long, mostly 4- to 6-flowered, on short pedicels. Glumes nearly equal, slightly shorter than the lemmas. Lemmas thin, about 1 mm. long, with inconspicuous lateral nerves. Grain plump, brownish, 0.3-0.5 mm. long.

GENERAL DISTRIBUTION: Southeastern United States to Uruguay, and Trinidad.

DISTRIBUTION IN LESSER ANTILLES: Barbados (*Allan 1*).

HABITAT: Moist, low open ground.

8. *Eragrostis acutiflora* (H.B.K.) Nees, Agrost. Bras. 501. 1829.

Basionym: *Poa acutiflora* H.B.K., Nov. Gen. Sp. 1: 161. 1816.

Type: Colombia.

Perennial with rather weak culms 30-60 cm. tall. Sheaths with tufts of long hairs on the upper margins (vicinity of the collar). Blades narrow, flat or loosely involute, narrowly attenuate at tip, often with a few long hairs on adaxial surface near base. Panicle open but narrow, 10-20 cm. long, with erect-spreading branches mostly 3-6 cm. long. Spikelets 5-12 mm. long, on moderately long pedicels but appressed along the panicle branches, 5- to more than 20-flowered. Lemmas 2.0-2.5 mm. long, narrowly acute to acuminate at tip, purple-tinged at maturity.

GENERAL DISTRIBUTION: Trinidad and Panama to Brazil and Bolivia.

DISTRIBUTION IN LESSER ANTILLES: Known in the Lesser Antilles from three collections, one from Guadeloupe (*P. Bena s.n.* (A, a fragment from P)), one from St. Vincent (*Gould 15089*) and one from Grenada (*Gould 15177*).

HABITAT: Open, moist soil, in ditches, roadsides and low fields, probably more common in the islands than the record indicates.

9. *Eragrostis purpurascens* (Spreng.) Schult., Mant. 2: 317. 1824.

Basionym: *Poa purpurascens* Spreng., Nov. Prov. Hal. 33. 1819.

Type: Uruguay.

Perennial with erect or spreading-erect culms, these sparingly branched below. Panicles large, about $\frac{2}{3}$ as wide as long, with slender, flexuous branches and divergent branchlets and pedicels. Spikelets about 8 mm. long, dark-colored. Lemmas acute, with obscure lateral nerves.

GENERAL DISTRIBUTION: Brazil to Argentina.

DISTRIBUTION IN LESSER ANTILLES: St. Barthelemy, Antigua, Guadeloupe.

HABITAT: Open slopes.

Hitchcock (Man. Grasses W. I. 44. 1936) noted: "This is the species described by Grisebach as *Eragrostis prolifera*. The plants from Antigua agree with Nees' [1829] description of *Eragrostis purpurascens* and with the Sello specimen cited by him, but they may not be *Poa purpurascens* of Sprengel."

10. *Eragrostis prolifera* (Sw.) Steud., Syn. Pl. Glum. 1: 278. 1854.

Basionym: *Poa prolifera* Swartz, Prodr. 27. 1788.

Type: St. Lucia, Guadeloupe. Hitchcock (Man. Grasses W. I. 45. 1936) noted: "Swartz in the original description gives the locality 'Insulae caribaeae.' In a later work [Fl. Ind. Occ. 1: 216. 1797] he gives 'Lucia, Guadeloupe'."

Syn.: *Eragrostis domingensis* (Pers.) Steud., Syn. Pl. Glum. 1: 278. 1854, based on *Poa domingensis* Pers. (Type: Santo Domingo.)

Eragrostis gigantea Trin. in Mem. Acad. St. Petersburg. VI. Math. Phys. Nat. 1: 403. 1830. (Type: Santo Domingo.)

Cespitose perennial with firm, often stout, several-noded culms up to 1.5 m. tall. Sheaths rounded, firm, light-colored at maturity. Blades narrow and elongate, mostly 2-5 mm. broad and 20-50 cm. or more long, attenuate into a slender, usually involute tip. Panicle loosely contracted, mostly 25-50 cm. long and 2.0-3.5 cm. broad. Spikelets 7- to 30-flowered, 5-10 mm. long, the lateral ones short-pedicel and appressed to the branchlets. Glumes nearly equal and only slightly shorter than lemmas, scabrous on the midnerve, very early deciduous. Lemmas 1.5-2.0 mm. long, with inconspicuous lateral nerves, becoming purple-tinged. Grain ovate or oblong, brownish, 0.6-0.8 mm. long, with a minutely ridged and reticulate pericarp.

GENERAL DISTRIBUTION: Cuba, Hispaniola and south through the Caribbean Islands to Colombia.

DISTRIBUTION IN LESSER ANTILLES: Antigua, Guadeloupe, Martinique, St. Lucia.

HABITAT: Seashores, brackish marshes and open ditches.

16. ELEUSINE Gaertner

Eleusine Gaertn., Fruct. & Sem. 1: 7, pl. 1, f. 11. 1788. FIGURE 18.

Low, weak-stemmed annuals, with succulent, flat or folded leaf blades. Ligule a short, lacerate membrane. Spikelets sessile in 2 rows on 2 (occasionally 1)-several branches digitately clustered at the culm apex and often 1 or 2 branches below the apical ones. Spikelets 3- to several-flowered, disarticulating above the glumes and between the florets. Glumes unequal, the first short, 1-nerved, the second 3- to 7-nerved. Lemmas acute, awnless or mucronate, 3-nerved, the lateral nerves close to the midnerve.

TYPE SPECIES: *Eleusine coracana* Gaertn.

Species about six; five are native to the warmer regions of the Eastern Hemisphere and one is found in South America.

1. **Eleusine indica** (L.) Gaertn., Fruct. & Sem. 1: 8. 1788.

Basionym: *Cynosurus indicus* L., Sp. Pl. 72. 1753.

Type: India.

Culms erect or spreading and stoloniferous at base, mostly 15-70 cm. long but much shorter on grazed or mowed plants. Sheaths laterally compressed and sharply keeled, glabrous or sparsely hispid on margins. Ligule about 1 mm. long. Blades elongate, 3-8 cm. broad, glabrous or somewhat hispid. Inflorescence branches 3-15 cm. long, with a flattened, winged rachis. Spikelets 3-6 mm. long, 3- to 6-flowered. Lemmas glabrous or sca-



FIGURE 18. Poaceae. a-d, *Eleusine indica*: a, habit, $\times 0.5$; b, spikelet, $\times 5$; c, floret, $\times 5$; d, seed, $\times 5$. (Reprinted from Hitchcock, Manual of the grasses of the West Indies, p. 114, fig. 72. 1936.)

brous, laterally compressed, acute or obtuse, occasionally mucronate. Grains plump, transversely rugose, 1-2 mm. long. Seed loosely enclosed by a thin pericarp.

GENERAL DISTRIBUTION: Worldwide in temperate and tropical regions; introduced in the Americas.

DISTRIBUTION IN LESSER ANTILLES: Anguilla, St. Martin, Antigua, Saba, St. Eustatius, St. Kitts, Nevis, Montserrat, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Grenada, Barbados.

HABITAT: Moist, usually disturbed sites, often a weed of cultivated soils.

17. DACTYLOCTENIUM Willdenow

Dactyloctenium Willd., Enum. Pl. 1029. 1809.

FIGURE 19.

Annual or perennial grasses, mostly with thick, weak culms and broad, flat leaf blades. Ligule membranous. Inflorescence of 2(rarely 1)-several digitately arranged, unilateral, spicate branches. Spikelets sessile, closely placed and imbricate in two rows on one side of a short, stout rachis. Spikelets 2- to several-flowered, laterally compressed. Disarticulation above the glumes and between the florets. Glumes equal to slightly unequal, broad, 1-nerved. Lemmas firm, broad, 3-nerved. Palea about as long as lemma. Grain plump, usually subglobose, with a minutely ridged and rugose seed loosely enclosed in a thin pericarp.

TYPE SPECIES: *Dactyloctenium aegyptium* (L.) Richter.

Species three or four, native to the warmer parts of the Eastern Hemisphere; one is introduced in the Americas.

1. *Dactyloctenium aegyptium* (L.) Beauv., Ess. Agrost. 72. 1812.

Basionym: *Cynosurus aegyptium* L., Sp. Pl. 72. 1753.

Type: "Africa, Asia, America."

Syn.: *Eleusine aegyptiaca* (L.) Desf., Fl. Atlant. 1: 85. 1798.

Annual, branching at base, the culms usually decumbent below and often stoloniferous, rooting at the lower nodes. Culms 10-60 cm. tall or long, glabrous. Sheaths glabrous, the lower ones usually laterally compressed and keeled. Ligule a fringed membrane 0.5-1.0 mm. long. Blades thin, flat or irregularly folded, usually ciliate on margins with long, papilla-based hairs and often hispid on one or both sides. Inflorescence typically with 2-6 thick, digitately arranged, spicate branches mostly 1.5-6 cm. long. Branch rachis densely hispidulose near the point of attachment to main axis, with 2 rows of closely placed, pectinately spreading spikelets from near base to tip. Rachis tip projecting beyond terminal spikelet as a sharp point 1-7 mm. long. Spikelets mostly 3-4 mm. long, 3- to 5-flowered, disarticulating between or above the glumes. Glumes firm, 1-nerved, subequal and about as long as the lemmas; first glume acute or with a minute, nearly straight awn, the second glume usually with a short, curved awn. Lemmas similar



FIGURE 19. Poaceae. a-d, *Dactyloctenium aegyptium*: a, habit, $\times 0.5$; b, spikelet, $\times 5$; c, floret, $\times 5$; d, seed (without pericarp), $\times 5$. (Reprinted from Hitchcock, Manual of the grasses of the West Indies, p. 115, fig. 75. 1936.)

to the glumes but with a midnerve and 2 faint lateral nerves, scabrous on midnerve. Paleas about as large as lemmas. Anthers 0.5 mm. or less long. Grain plump, reddish-brown, 1 mm. or slightly less long, coarsely rugose and transversely ridged.

GENERAL DISTRIBUTION: Worldwide in tropical and subtropical areas; introduced in the Americas and present throughout the West Indies.

DISTRIBUTION IN LESSER ANTILLES: Anguilla, St. Martin, St. Barthelemy, Antigua, Saba, St. Eustatius, St. Kitts, Nevis, Montserrat, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, the Grenadines, Grenada, Barbados.

HABITAT: A weed of ditches, vacant lots, and other disturbed sites.

18. LEPTOCHLOA Beauvois

Leptochloa Beauv., Ess. Agrost. 71, 166, *pl. 15, f. 1*. 1812. FIGURE 20.

Cespitose annuals and perennials, the annuals often large and coarse. Culms leafy to well above base, the leaves with flat, linear blades. Ligules membranous. Inflorescence with few to numerous slender, spicate branches scattered along the main axis or infrequently clustered near the tip. Spikelets 2- to 12-flowered, disarticulating above the glumes and between the florets. Glumes thin, 1-nerved or the second occasionally 3-nerved, awnless or mucronate. Lemmas obtuse or acute, sometimes notched and mucronate or short-awned, often puberulent on the nerves. Paleas well developed, occasionally puberulent on the nerves.

TYPE SPECIES: *Cynosurus virgatus* L., now correctly known as *Leptochloa virgata* (L.) Beauv.

A genus of about 20 species, distributed in the warmer parts of both hemispheres.

KEY TO THE SPECIES

1. Spikelets 2-4 mm. long, 2- to 8-flowered. 2
- 1a. Spikelets 5-10 mm. long, 6- to 12-flowered; annual. 3. *L. fascicularis*
2. Plants perennial; spikelets 2- to 8-flowered; lemmas 1.5-2.8 mm. long, awnless or with an awn 1-3 mm. long. 1. *L. virgata*
- 2a. Plants annual; spikelets 2- to 4-flowered; lemmas 1.0-1.6 mm. long, awnless. 2. *L. filiformis*

1. *Leptochloa virgata* (L.) Beauv., Ess. Agrost. 71, 161, 166, *pl. 15, f. 1*. 1812.

Basionym: *Cynosurus virgatus* L., Syst. Nat. ed. 10. 2: 876. 1759.

Type: Jamaica.

Syn.: *Eleusine virgata* (L.) Pers., Syn. Pl. 1: 87. 1805.

Leptochloa domingensis (Jacq.) Trin., Fund. Agrost. 133. 1820. (Type: Probably Dominican Republic, Santo Domingo.)

Cynosurus domingensis Jacq., Misc. 2: 363. 1781; Ic. Pl. Rar. 1: *pl. 22*. 1783.



FIGURE 20. Poaceae. a, b, *Leptochloa virgata*: a, inflorescence, $\times 0.5$; b, spikelet, $\times 40$. (Reprinted from Gould, Grasses of the Texas Coastal Bend, p. 90, fig. 87 (as *L. domingensis*). 1965.)

Cespitose perennial with several- to many-noded, wiry culms 30-100 cm. tall. Ligule a minute, fringed membrane. Leaves glabrous or sparsely hirsute, the blades flat, elongate, mostly 4-12 mm. broad. Inflorescence usually with 5-16 slender, weak, often curving branches 3-14 cm. long, these single or occasionally in twos or threes on the main axis. Spikelets 2-4 mm. long, (2- or) 3- to 8-flowered, the upper florets successively reduced in size. Glumes glabrous, 1-nerved, 1.2-3.2 mm. long. Lemmas 1.5-2.8 mm. long, glabrous, ciliate or variously hispid, awnless or with an awn up to 3 mm. long.

GENERAL DISTRIBUTION: Southern Florida and Texas south through the Caribbean and Mexico to South America.

DISTRIBUTION IN LESSER ANTILLES: St. Martin, Antigua, Saba, St. Eustatius, St. Kitts, Montserrat, Marie Galante, Martinique, St. Lucia, St. Vincent, Grenada.

HABITAT: Low, open sites, on a wide variety of soil types.

Hitchcock (Man. Grasses W. I. 106. 1936) recognized *L. domingensis* as distinct from *L. virgata*, stating the diagnostic characters of the former as pubescent leaves and relatively long-awned, pubescent lemmas, in contrast to the glabrous leaves and glabrous, awnless or very short-awned lemmas of *L. virgata*. Parodi (in Rev. Fac. Agron. Vet. II: 93.1919) also recognized *L. domingensis* as distinct but figured *L. virgata* as having longer lemma awns than *L. domingensis* (*ibid.*, p. 95). Several other species have been proposed in the *L. virgata* complex including *L. procera* Nees and *L. villosa* Ekman. Further study is needed to clarify relationships of the populations involved.

2. *Leptochloa filiformis* (Lam.) Beauv., Ess. Agrost. 71, 166. 1812.

Basionym: *Festuca filiformis* Lam., Tabl. Encycl. Méth. Bot. I: 191. 1791.

Type: South America.

Syn.: *Eleusine mucronata* Michx., Fl. Bor.- Amer. I: 65. 1803. (Type: Illinois.)

Leptochloa mucronata (Michx.) Kunth, Rev. Gram. I: 91. 1829.

Leptochloa brachiata Steud., Syn. Pl. Glum. I: 209. 1854. (Type: Guadeloupe, Duchassaing.)

Weedy annual with slender, weak culms that often are geniculate and branching below. Herbage often purplish or reddish. Culms 10-80 cm. or more tall. Sheaths papillose-hispid, rounded on back. Ligule a dense fringe of hairs 1-2 mm. long on a minute membranous base. Blades thin, flat, linear, 1-10 mm. broad. Inflorescence mostly 8-35 cm. long and $\frac{1}{3}$ - $\frac{1}{2}$ the length of the entire culm. Inflorescence branches few to numerous, scattered, slender, flexuous, (2-)3-8(-15) cm. long and 1-2 mm. thick, erect-spreading or widely spreading at maturity. Spikelets 2- to 4-flowered, 1.5-3.0 mm. long, widely spaced on the rachis and only slightly overlapping. Glumes acute, the first as long as the lower floret and the second slightly longer. Lemmas mostly 1.0-1.6 mm. long, usually but not always hairy on nerves below middle, obtuse or truncate at apex. Caryopsis 0.7-0.8 mm. long.

GENERAL DISTRIBUTION: Frequent in southeastern United States, north to Virginia and southern Indiana, west through Texas, New Mexico and Arizona to southern California and south through Mexico, Central America, the Caribbean, and much of South America.

DISTRIBUTION IN LESSER ANTILLES: St. Martin, Antigua, St. Kitts, Montserrat, Guadeloupe, Martinique, St. Lucia, St. Vincent, Grenada and Barbados.

HABITAT: A weed of loose, disturbed soils, in ditches, gardens, waste areas and waysides.

3. *Leptochloa fascicularis* (Lam.) A. Gray, Man. 588. 1848.

Basionym: *Festuca fascicularis* Lam., Tabl. Encycl. Méth. Bot. 1: 189. 1791.

Type: South America.

Syn.: *Diplachne fascicularis* (Lam.) Beauv., Ess. Agrost. 81, pl. 16, f. 9. 1812.

Festuca thouini Steud., Syn. Pl. Glum. 1: 311. 1854. (Type: Dominican Republic, Santo Domingo.)

Annual with coarse, somewhat succulent culms mostly 50-100 cm. tall, the culms usually in large clumps. Under adverse conditions such as drought, salinity, or trampling by animals, the flowering culms may not be over 10-15 cm. tall. Culms leafy from base to inflorescence, the uppermost usually sheathing the panicle at base and with a long blade overtopping the inflorescence. Lower sheaths usually keeled, the upper rounded on the back. Ligules membranous, 2-6 mm. long, lacerate but not ciliate. Blades firm, glabrous or sparsely hispid, elongate, 2-7 mm. broad, usually loosely involute on drying. Inflorescence 10-30 cm. long, with usually 8-35 stiffly erect or erect-spreading branches, the branches mostly 4-12 cm. long. Spikelets 5-10 mm. long and 6- to 12-flowered, bluish, grayish or occasionally violet at maturity. Glumes broad or narrow, 1-nerved, the second mostly 3.0-4.2 mm. long and often short-awned, the first shorter and awnless. Lemmas ovate to oblong, usually pubescent on marginal nerves and midnerve below the middle, acute or acuminate but often with a slightly notched apex, the central nerve usually projecting as an awn 0.5-1.5 mm. long, the lateral nerves often mucronate. Body of lowermost lemma usually 3-5 mm. long, occasionally shorter.

GENERAL DISTRIBUTION: Widely distributed in the United States, ranging south through the Caribbean, Mexico and Central America to southern South America.

DISTRIBUTION IN LESSER ANTILLES: Antigua, Guadeloupe and Martinique.

HABITAT: Moist or marshy soils, often along streams and the shores of ponds and lakes.

19. *SPOROBOLUS* R. Brown

Sporobolus R. Br., Prodr. Fl. Nov. Holl. 169. 1810.

FIGURE 21.

Plants of extremely diverse habit, from low, delicate annuals to tall,

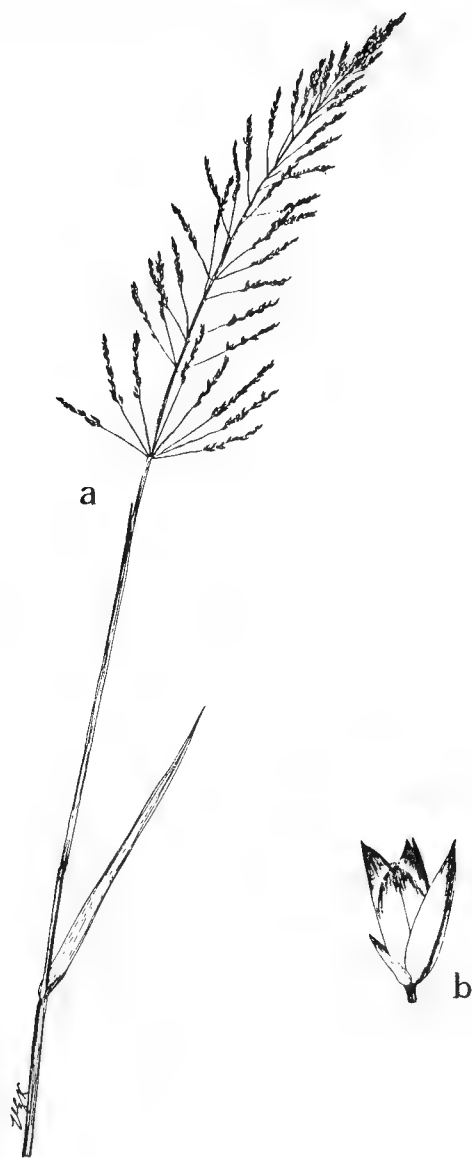


FIGURE 21. Poaceae. a, b, *Sporobolus pyramidatus*: a, inflorescence, $\times 0.5$; b, spikelet, $\times 12$. (Reprinted from Gould, Grasses of the Texas Coastal Bend, p. 159, fig. 165, 1965.)

coarse, cespitose or rhizomatous perennials. Ligule usually a short, pilose or ciliate membrane. Inflorescence an open or contracted panicle of small, awnless, 1-flowered spikelets. Disarticulation above glumes. Glumes 1-nerved, usually unequal and at least the first shorter than the lemma. Lemmas 1-nerved, thin, awnless. Paleas well developed, often splitting down the middle at maturity. Grain obovate, usually falling free from the lemma and palea and thus not a caryopsis.

TYPE SPECIES: *Sporobolus indicus* (L.) R. Br., based on *Agrostis indica* L.

Species about 100, in temperate and tropical regions of both hemispheres.

KEY TO THE SPECIES

1. Plants annual; spikelets 1.0 mm. or less long. 1. *S. tenuissimus*
- 1a. Plants perennial; spikelets more than 1.0 mm. long. 2
2. Culms rhizomatous at base; leaves numerous, crowded, distichous; blades thick, involute on drying. 2. *S. virginicus*
- 2a. Culms not rhizomatous at base; leaves not numerous, crowded and distichous; blades flat or involute. 3
3. Glumes both shorter than spikelet. 4
- 3a. Glumes, at least the second, about as long as the spikelet. 5
4. Second glume usually half or more as long as spikelet; panicle branches short, appressed, the inflorescence usually interrupted-spicate in appearance. 3. *S. indicus*
- 4a. Second glume less than half as long as spikelet; panicle branches well developed, slender, loosely erect or spreading. 4. *S. jacquemontii*
5. Spikelets 1.5-2.0 mm. long; branches of inflorescence typically bare of spikelets on lower $\frac{1}{4}$ - $\frac{1}{2}$ 5. *S. pyramidatus*
- 5a. Spikelets 3.0-4.5 mm. long; branches of inflorescence spikelet-bearing to near base. 6. *S. purpurascens*

1. *Sporobolus tenuissimus* (Schrank) Kuntze, Rev. Gen. Pl. 3(2): 369. 1898.

Basionym: *Panicum tenuissimum* Schrank in Denkshacr. Bot. Ges. Regensb. 2: 26. 1822.

Type: Brazil.

Syn.: *Sporobolus muralis* (Raddi) Hitchc. & Chase in Contr. U. S. Natl. Herb. 18: 368. 1917. (Type: Brazil.)

Tufted annual with slender, glabrous culms 25-75 cm. tall. Ligule a minute, ciliate rim. Blades thin, flat, glabrous, 5-15 cm. long and 1-4 mm. broad. Panicle delicate, open but narrow, mostly 3-6 cm. wide, with numerous short, slender branches and short- or long-pediceled spikelets on crinkly, capillary branchlets. Spikelets mostly 0.8-1.0 mm. long, glabrous, rather dark in color. Glumes thin, broad, more or less erose at apex, the second about $\frac{1}{2}$ as long as the lemma, the first much shorter. Lemma and palea similar in texture and about equal in length, widely separated at maturity to expose the grain. Grain 0.5-0.7 mm. long, plump, turgid, obovate and flattened at apex, with a minutely alveolate surface.

GENERAL DISTRIBUTION: The Lesser Antilles south to Brazil.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe, Martinique, St. Lucia, St. Vincent, Grenada, Barbados.

HABITAT: Sandy, open ground, often a weed of wasteplaces.

2. *Sporobolus virginicus* (L.) Kunth, Rev. Gram. 1: 67. 1829.

Basionym: *Agrostis virginica* L., Sp. Pl. 63. 1753.

Type: Virginia.

Syn.: *Sporobolus littoralis* (Lam.) Kunth, Rev. Gram. 1: 68. 1829. (Type: Tropical America.)

Perennial with firm, leafy, many-noded culms 10-50(-65) cm. tall from stout, creeping rhizomes. Sheaths rounded, mostly overlapping, glabrous except for a few long hairs on either side of the collar and occasionally along the margins. Ligule a minute, ciliate membrane. Blades firm, glabrous or scabrous, 1-5 mm. broad, involute on drying. Panicles contracted, spicate, densely flowered, mostly 2-8 cm. long and 5-7(-10) mm. thick. Spikelets straw-colored or grayish, occasionally purple-tinged, glabrous, 1.8-3.2 mm. long. Glumes acute, very unequal to nearly equal, the second usually as long as or slightly longer than the lemma. Paleas as long as lemmas. Anthers about 1 mm. long.

GENERAL DISTRIBUTION: Along the coast from Virginia to Florida and Texas, south through Mexico and the West Indies to Brazil; also in South Africa.

DISTRIBUTION IN LESSER ANTILLES: Anguilla, St. Martin, St. Barthelemy, Antigua, Saba, St. Eustatius, St. Kitts, Guadeloupe, Marie Galante, Dominica, Martinique, St. Lucia, St. Vincent, the Grenadines, Grenada.

HABITAT: Sandy seashores and saline coastal areas.

3. *Sporobolus indicus* (L.) R. Br., Prodr. Fl. Nov. Holl. 1: 170. 1810.

Basionym: *Agrostis indica* L., Sp. Pl. 63. 1753.

Type: Jamaica.

Syn.: *Agrostis compressa* Poir. in Lam., Encycl. Méth. Bot. Suppl. 1: 258. 1810, non Willd., 1790. (Type: Carolina.)

Axonopus poiretii Roem. & Schult., Syst. Veg. 2: 318. 1817, based on *Agrostis compressa* Poir.

Sporobolus poiretii (Roem. & Schult.) Hitchc. in Bartonia 14: 32. 1932.

Sporobolus berterianus (Trin.) Hitchc. & Chase in Contr. U. S. Natl. Herb. 18: 370. 1917. (Type: Dominican Republic, Santo Domingo.)

Cespitose perennial with tough fibrous roots and glabrous culms and leaves. Culms firm, stiffly erect, 30-100 cm. tall, unbranched above the base. Ligule a ciliate membrane 0.2-0.5 mm. long. Blades 1-4 mm. broad, tapering into long, flexuous, filiform tips. Panicle 10-30(-40) cm. long, narrow, contracted, with short, densely flowered branches, these obscuring

much or most of the main axis. Spikelets 1.4-2.0 mm. long. Glumes thin, irregularly developed, the second acute, $\frac{1}{2}$ - $\frac{2}{3}$ as long as lemma, the first usually shorter. Lemmas of same texture as glumes, essentially glabrous. Paleas as long as lemmas and similar in texture. Grains broad, laterally flattened, broadly rounded or truncate at apex, reddish-brown at maturity, frequently blackened by smut.

GENERAL DISTRIBUTION: Virginia to Oklahoma and south through the Caribbean, Central and South America to Argentina.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe.

HABITAT: Usually on open clay sites but also on sand, often on disturbed soils.

4. *Sporobolus jacquemontii* Kunth, Rev. Gram. 2: 427, pl. 127. 1831.

Type: Dominican Republic, Santo Domingo.

Cespitose perennial with culms 30-100 cm. tall, the culms usually in clumps of several to many but not branched above base. Herbage essentially glabrous. Blades long and narrow, usually not over 2 mm. broad, attenuate into long, flexuous, filiform tips. Panicles 15-30 cm. long, loosely contracted or the branches erect-spreading. Panicle branches mostly 2-6 cm. long, floriferous to base, sparingly if at all rebranched, usually rather widely spaced and not obscuring the main axis. Spikelets mostly 1.7-2.0 mm. long, short-pedicel and appressed along the branches, glabrous. Glumes short, broad, slightly unequal, broadly obtuse or truncate and erose at apex, typically $\frac{1}{4}$ - $\frac{1}{3}$ the length of the spikelet. Lemma and palea about equal and similar in texture.

GENERAL DISTRIBUTION: Mexico and the West Indies south to Colombia and Brazil.

DISTRIBUTION IN LESSER ANTILLES: St. Martin, Antigua, Saba, St. Kitts, Montserrat, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, the Grenadines, Grenada, Barbados.

HABITAT: Open, usually sandy areas, from near sea level to 270 meters elevation.

This tough bunchgrass is perhaps the most widespread and well-established grass in the Lesser Antilles. On the island of Bequia, this species was observed by the writer to serve to tether goats and sheep on hard, clayey soil.

5. *Sporobolus pyramidatus* (Lam.) Hitchc., U. S. D. A. Misc. Publ. 243: 84. 1936.

Basionym: *Agrostis pyramidata* Lam., Tabl. Encycl. Méth. Bot. 1: 161. 1791.

Type: South America, *Richard*. Type examined by Hitchcock in Lamarck Herbarium in 1935.

Syn.: *Sporobolus argutus* (Nees) Kunth, Rev. Gram. 1: Sup. XVII. 1830. (Type: Brazil.)

Low, tufted perennial. Culms numerous, often spreading at base, glabrous, mostly 10–50 cm. tall. Sheaths glabrous or with a few hairs on the upper margins. Ligule a fringe of hairs on a membranous collar, 0.5–0.8 mm. long. Blades flat, 3–12(–20) cm. long and mostly 2–4 mm. broad, usually ciliate on lower margins and sparsely hispid on adaxial surface. Panicles open, more or less pyramidal, mostly 3–15(–18) cm. long and 2–5 cm. broad at base, the lower and middle branches in whorls and bare of spikelets on the lower $\frac{1}{4}$ – $\frac{1}{2}$. Spikelets 1.5–2.0 mm. long, the lateral ones on very short pedicels. Glumes very unequal, thin, acute, the first 0.3–0.8 mm. long, the second as long as the lemma. Lemma acute, glabrous or scabrous. Palea hyaline, slightly shorter than the lemma. Grain broadly oblong, flattened laterally, usually 0.6–0.9 mm. long, pale orange, the pericarp finely striate.

GENERAL DISTRIBUTION: Kansas to Colorado and south through the West Indies and Mexico to Argentina.

DISTRIBUTION IN LESSER ANTILLES: Anguilla, St. Martin, Antigua, Nevis, Guadeloupe, Martinique, Barbados.

HABITAT: Frequent on coastal sands and inland on low, saline or alkaline sites.

6. *Sporobolus purpurascens* (Sw.) Hamilt., Prodr. 5. 1825.

Basionym: *Agrostis purpurascens* Sw., Prodr. 25. 1788.

Type: Jamaica.

Cespitose perennial with flat, rather broad blades mostly in a basal tuft. Culms stiffly erect, 25–90 cm. tall. Sheaths rounded, glabrous or hispid-ciliate on margins. Ligule a short, ciliate membrane or callus. Blades mostly 8–15(–22) cm. long and 2–6 mm. broad, attenuate to a slender point, usually ciliate on lower margins with long, stiff hairs. Panicles dark-colored, contracted, usually 10–25 cm. long and 0.8–1.6 cm. thick, often interrupted below. Panicle branches in well-defined verticils, typically 0.8–2.0 (–3.0) cm. long, densely flowered nearly to base. Spikelets purple- or bronzinged, 3.0–4.5 mm. long. Glumes thin, acute, glabrous, the first 1.6–2.5 mm. long, the second 3.0–4.5 mm. long. Lemma and palea equal to second glume and similar in texture. Caryopses 2.0–2.2 mm. long and about 1 mm. wide, reddish-brown. Embryo about half the length of the endosperm, the pericarp becoming gelatinous when moistened.

GENERAL DISTRIBUTION: Southern Texas to eastern Mexico, the West Indies and Central America to Brazil.

DISTRIBUTION IN LESSER ANTILLES: Antigua and Martinique.

HABITAT: In open, grassy areas and in partial shade of open woodlands.

20. THYSANOLAENA Nees von Esenbeck

Thysanolaena Nees in Edinb. New Philos. Jour. 18: 180. 1835.

Tall, bamboo-like perennial with densely clumped, more or less woody culms and large, broad, flat blades. Inflorescence a large, open, much-branched panicle of small, short-pediceled, 2- to 4-flowered, awnless spikelets. Lower and upper florets (when there are 3-4) neuter or staminate, the other one or two perfect.

TYPE SPECIES: *Agrostis maxima* Roxb., now correctly known as *Thysanolaena maxima* (Roxb.) O. Ktze.

A monotypic Asiatic genus, the single species widely introduced through the tropics and subtropics as an ornamental.

1. *Thysanolaena maxima* (Roxb.) O. Ktze., Rev. Gen. Pl. 2: 704. 1891.

Basionym: *Agrostis maxima* Roxb., Fl. Ind. I: 319. 1820.

Type: India, "a native of hedges, &c. amongst the mountains."

Culms glabrous, firm and shiny, commonly 2-3 m. tall, forming large dense clumps. Leaves glabrous except for a ring of hairs on the collar and behind the ligule. Sheaths tightly enclosing the culms, with a firm, raised rim sharply differentiating sheath from blade. Ligule membranous, 1-2 mm. long. Blades up to 50 cm. long and 7 cm. broad, with a petiolelike constriction at base. Inflorescence a well-exserted panicle as much as 60 cm. long and 20 cm. broad, with numerous long, slender, often drooping branches. Spikelets about 2 mm. long, with short, broad, faintly 1-nerved glumes less than half the length of the lemmas. Lowermost floret reduced to a papery lemma. Lemma of second (and often third) floret with marginal rows of long, crinkled, papilla-based hairs. Palea a narrow, hyaline scale. Grain ovoid, reddish-brown, about 0.6 mm. long.

GENERAL DISTRIBUTION: Native to China, India, Burma and Thailand; widely introduced elsewhere in warm regions.

DISTRIBUTION IN LESSER ANTILLES: St. Lucia, collected in cleared woodland at 600 feet elevation, *Sturrock 671*.

HABITAT: Usually growing in shaded sites.

21. CHLORIS Swartz

Chloris Sw., Prodr. 25. 1788.

FIGURE 22.

Annuals and perennials, many with stolons or rhizomes. Ligule a ring of cilia or absent. Blades narrow to moderately broad, flat, folded or involute. Inflorescence with usually 4-25 (occasionally 1-3) one-sided spicate branches, these digitate or in 2-several verticils. Spikelets sessile or subsessile, imbricate to distant, in two rows on the branch rachis. Glumes usually unequal in length, lanceolate, shorter than the florets. Spikelets

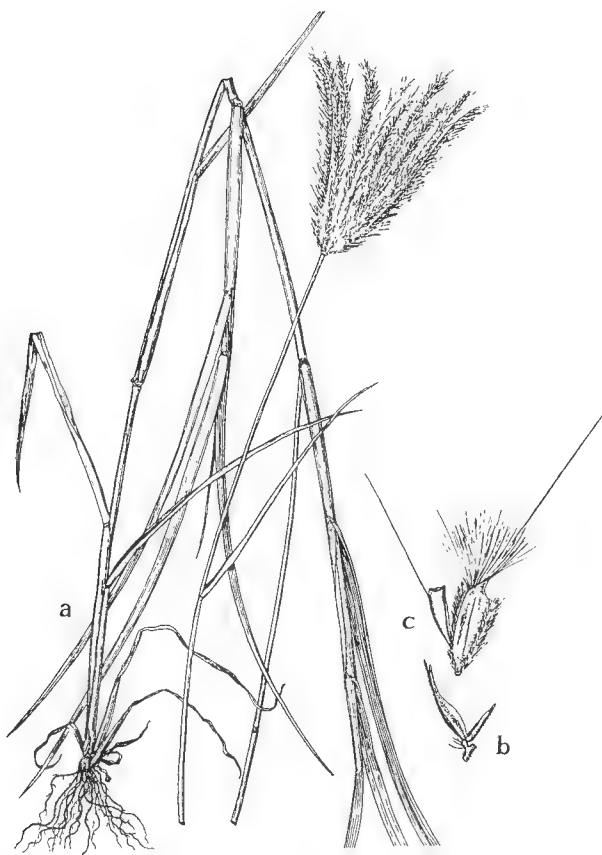


FIGURE 22. Poaceae. a-c, *Chloris virgata*: a, habit and inflorescence, $\times 0.5$; b, glumes, $\times 3$; c, spikelet, $\times 3$. (Reprinted from Gould, Grasses of the Texas Coastal Bend, p. 54, fig. 49. 1965.)

with the lowermost floret perfect and 1-3 reduced (staminate or neuter) florets above. Lemma of lower floret 3-nerved, variously pubescent on the nerves and awned from the tip or between 2 teeth. Reduced florets awned or awnless. Caryopses ovoid to obovoid, with an embryo $\frac{1}{3}$ - $\frac{1}{2}$ the length of the caryopsis.

TYPE SPECIES: *Chloris cruciata* (L.) Swartz, based on *Agrostis cruciata* L.

A genus of 56 or 57 species widely distributed in the warmer regions of the world. The following treatment is based on Dennis E. Anderson, Taxonomy of the genus *Chloris* (Gramineae), in Brigham Young Univ. Sci. Bull., Biol. Series 19(2): 1-133. 1974.

KEY TO THE SPECIES

1. Reduced (staminate or neuter) florets 2, broad and inflated, broadest at the truncate apex; lemma of perfect (lowermost) floret long-pubescent on the lateral nerves. 2
- 1a. Reduced florets 1 (occasionally 2 in robust specimens), broad or narrow; lemma of perfect (lower) floret pubescent on nerves or not. 4
2. Lemma awns 0.5-2.7 mm. long; plants perennial. 3
- 2a. Lemma awns 4.0-7.7 mm. long; plants annual. 3. *C. inflata*
3. Inflorescence branches 3-5 (rarely 6 or 7), usually less than 8 cm. long. 1. *C. ciliata*
- 3a. Inflorescence branches (7-)10-20(-40), commonly 8 cm. or more long. 2. *C. dandiyana*
4. Reduced floret less than 1 mm. long excluding the awn. 5. *C. radiata*
- 4a. Reduced floret more than 1 mm. long. 5
5. Lemma of perfect floret with a tuft of long hairs on upper margins, the lemma apex truncate; plants annual. 4. *C. virgata*
- 5a. Lemma of perfect floret without a tuft of long hairs on the upper margins or if so then the lemma apex not truncate; plants perennial. 6
6. Inflorescence branches strongly divergent, becoming horizontally spreading or even reflexed; keel of lemma glabrous or occasionally sparsely appressed-pubescent; callus hairs 0.3-0.8 mm. long; marginal nerves of lemma with hairs infrequently over 0.5 mm. long. 6. *C. sagraeana*
- 6a. Inflorescence branches not divergent more than 45° from the vertical axis; keel of lemma usually prominently appressed-pubescent (rarely glabrous); longest hairs of callus 1.0-1.2 mm. long; marginal nerves of lemma to 1 mm. or more long. 7. *C. cubensis*

1. *Chloris ciliata* Sw., Prodr. 25. 1788.

Type: Swartz, Jamaica.

Syn: *Chloris propinqua* Steud., Syn. Pl. Glum. 1: 204. 1854. (Type: "Duchassaing legit in Guadeloupe.")

Tufted perennial with culms 25-60 cm. tall. Sheaths glabrous. Ligule a short ciliate crown or absent. Blades mostly 10-20 cm. long and 4-5 mm. broad, glabrous or scabrous. Inflorescence branches 3-5 (rarely 6 or 7), 3.5-6.0(-8.0) cm. long, somewhat flexuous and spreading. Glumes narrowly lanceolate, glabrous except for the scabrous midnerve. Lemma of perfect

floret 1.8-2.8 mm. long, strongly flattened, with densely ciliate keel and lateral nerves, the hairs 0.5-1.5 mm. long. Lemma awn 0.9-2.7 mm. long. Reduced florets 2, glabrous, the lower 1.2-1.8 mm. long and with an awn 0.9-1.4 mm. long, the upper 0.8-1.1 mm. long and awnless. Caryopsis about 1.4 mm. long and 0.7 mm. broad, with an embryo about half the length of the endosperm.

GENERAL DISTRIBUTION: South central United States, Mexico and Central America, the Caribbean, and South America to Argentina.

DISTRIBUTION IN LESSER ANTILLES: St. Martin, St. Barthelemy, Barbuda, Antigua, Nevis, Guadeloupe, Dominica, Martinique, St. Lucia.

HABITAT: Open grasslands, often in sandy soil.

2. *Chloris dandyana* C. D. Adams in *Phytologia* 21: 408. 1971, based on *Andropogon barbatum* L., *Syst. Nat.* ed. 10. 2: 1305. 1759, non *A. barbatum* L., 1771.

Type: *Sloane*, Jamaica.

Syn.: *Andropogon polydactylon* L., *Sp. Pl.* ed. 2. 2: 1483. 1763.

Chloris polydactyla (L.) Sw., *Prodr.* 26. 1788.

Chloris barbata (L.) Nash in *Bull. Torrey Bot. Club* 25: 443. 1898.

Perennial with tufted culms to 135 cm. tall, rhizomes occasionally produced. Ligule long-pilose. Blades flat or folded, to 45 cm. long and 0.5-1.5 cm. broad, usually glabrous with scabrous margins. Inflorescence branches numerous, usually 8-25 or more, flexuous, loosely spreading-erect, to 20 cm. long. Spikelets densely imbricate on a scabrous to hispid, ciliate rachis. Glumes unequal, the second 1.9-3.5 mm. long, the first shorter. Lemma of lowermost (perfect) floret 1.6-2.8 mm. long, elliptic, flattened, the margins densely ciliate with hairs 1-3 mm. long, the keel appressed-pilose. Awn of lemma 1.4-4.8 mm. long. Reduced florets 2, the lower cylindrical to narrowly turbinate, with an awn 1.7-4.0 mm. long, the upper less than 1 mm. long and awnless. Caryopsis about 1 mm. long and 0.5 mm. broad.

GENERAL DISTRIBUTION: Southern Florida, the Greater Antilles and South America.

DISTRIBUTION IN LESSER ANTILLES: Reported only from Antigua (*Hitchcock* 16394; *Box* 26, 38).

HABITAT: Open grasslands at low elevations.

3. *Chloris inflata* Link, *Enum. Pl.* 1: 105. 1821.

Type: The type from seeds sent by Chamisso, reportedly from California but, according to A. S. Hitchcock (*Man. Grasses* W. I. 134. 1936), it is probably from Mexico.

Syn: *Andropogon barbatum* L., *Mantissa* 302. 1771, non *A. barbatum* L., *Syst. Nat.* ed. 10. 2: 1305. 1759. (Type: "Habitat in India orientali.")

Chloris barbata (L.) Sw., *Fl. Ind. Occ.* 1: 200. 1797, based on *Andropogon barbatum* L., 1771, non *A. barbatum* L., 1759.

Tufted annual with culms often decumbent below and rooting at lower nodes. Sheaths glabrous. Ligule short, pilose or short-ciliate. Blades mostly 7-15 cm. long and 3-6 mm. broad, glabrous, occasionally pilose toward the base. Inflorescence with 7-15 digitate branches 3-8 cm. long, the branches usually only slightly spreading and sometimes flexuous. Spikelets closely imbricated, tawny, with 2 or occasionally 3 reduced florets above the perfect one. Glumes narrowly lanceolate, hyaline, glabrous except for the scabrous midnerve, the second glume 2.3-2.7 mm. long, the first considerably shorter. Lemma of lower floret ovate to elliptic, 2.0-2.7 mm. long, the callus and upper margins pilose with hairs to 1 mm. long, the keel glabrous to pilose. Lemma awn 4.0-7.7 mm. long. Reduced florets usually glabrous, the lower broadened above to a truncate apex, 1.3-1.8 mm. long and with an awn 0.9-1.4 mm. long. Upper reduced floret similar to the lower but smaller and usually broadly inflated.

GENERAL DISTRIBUTION: Throughout the warmer parts of the world, often growing as a weed of disturbed sites.

DISTRIBUTION IN LESSER ANTILLES: Anguilla, St. Martin, Antigua, St. Eustatius, Nevis, Montserrat, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, the Grenadines, Grenada, Barbados.

HABITAT: On sandy shores and in loose, disturbed soils of cultivated areas and wastelands.

4. *Chloris virgata* Sw., Fl. Ind. Occ. 1: 203. 1797.

Type: "Provenit in Antigua."

Syn.: *Chloris elegans* H.B.K., Nov. Gen. Sp. 1: 166, pl. 49. 1816. (Type: Bonpland 4194, Querétaro, Mexico.)

Annual, extremely variable in size and habit, usually tufted, with glabrous culms from a few cm. to over 1 m. tall, often decumbent and stoloniferous at base. Sheaths usually glabrous, the uppermost often slightly inflated. Ligule a short, glabrous or fringed membrane. Blades glabrous or scabrous, mostly 7-15 cm. long and 2-3 mm. broad. Inflorescence with 4-20 digitate, more or less erect branches 5-10 cm. long. Spikelets mostly 2.5-4.3 mm. long, usually with a single reduced floret above the perfect one but occasionally with two, the second when present rudimentary. Glumes lanceolate, glabrous except for the scabrous midnerve, the second glume 2.5-4.3 mm. long, the first much shorter. Lemma of lower floret ovate to elliptic, 2.5-4.2 mm. long, pale brown or occasionally purplish, with midnerve and lower margins variously pubescent, the upper margins ciliate with hairs 2.5-4.2 mm. long. Awn usually 5-15 mm. long. Reduced floret similar in shape to the perfect one, 1.1-2.9 mm. long and with an awn 3.0-9.5 mm. long.

GENERAL DISTRIBUTION: Throughout the warmer regions of the world.

DISTRIBUTION IN LESSER ANTILLES: Barbuda, Antigua, Guadeloupe, Martinique.

HABITAT: Common as a weed of loose, disturbed soils and on sandy flats along the ocean.

5. *Chloris radiata* (L.) Sw., Prodr. 26. 1788.

Basionym: *Agrostis radiata* L., Syst. Nat. ed. 10. 2: 873. 1759.

Type: Jamaica.

Syn.: *Cynosurus scoparius* Lam., Encycl. Méth. Bot. 2: 188. 1786. (Type: "St. Dominique.")

Chloris glaucescens Steud., Syn. Pl. Glum. 1: 206. 1854. (Type: *Duchassaing*, Guadeloupe.)

Annual with culms 30–60 cm. tall, often decumbent at base and rooting at lower nodes. Sheaths broad, laterally compressed, glabrous or occasionally pilose. Ligule a short, ciliate crown, sometimes with a few longer hairs intermixed. Blades flat or folded, 8–30 cm. long, mostly 4–8(–10) mm. broad, scabrous or sparsely pilose. Inflorescence branches 5–18, in one, two or three verticils, the branches spreading-erect, 5–8 cm. long. Spikelets with a single reduced floret above the perfect one. Glumes narrowly lanceolate, acuminate or short awn-tipped, the second 2.0–2.7 mm. long, the first shorter. Lemma of lower floret 2.8–3.3 mm. long, narrow, glabrous except the upper margins short-ciliate, awned from just below apex, the awn 6–13 mm. long. Upper floret greatly reduced, narrow, 0.2–0.7 mm. long and with an awn 3–5 mm. long. Caryopsis 1.4–1.5 mm. long.

GENERAL DISTRIBUTION: Throughout the Antilles, southern Mexico, Central America and northern South America.

DISTRIBUTION IN LESSER ANTILLES: St. Martin, Antigua, Saba, St. Kitts, Montserrat, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, the Grenadines, Grenada, Barbados.

HABITAT: Common in open, disturbed sites such as roadsides, ditches and wastelands.

6. *Chloris sagraeana* A. Rich. in Sagra, in Hist. Fisica Politica Natural Isla Cuba XI (Botanica): 315. 1850.

Type: Cuba.

Syn.: *Chloris eleusinoides* Griseb., Fl. Br. W. Ind. 539. 1864. (Type: Antigua and Jamaica.)

Tufted perennial with culms 15–18 cm. tall. Sheaths glabrous. Ligule short-ciliate. Blades glabrous, mostly 8–15 cm. long and 1.3–3.0 mm. broad. Inflorescence with 3–6 branches in one or two verticils, the branches (3.5–) 4–9(–15) cm. long, spreading at a wide angle and often slightly reflexed. Spikelets mostly 2.6–3.6 mm. long, not closely imbricated, with a single rudiment above the perfect floret or infrequently with 2 rudiments. Glumes thin, lanceolate, unequal, the second 2.4–3.5 mm. long. Lemma of lower floret 2.6–3.5 mm. long, the callus bearded, the keel glabrous, the margins appressed-pilose with hairs usually less than 0.5 mm. long. Awn of lemma

7-13 mm. long. Reduced floret 0.7-1.6 mm. long, cylindrical, glabrous, acute at apex, with an awn 3.3-9.0 mm. long. Second rudiment greatly reduced when present. Caryopsis 1.6-1.7 mm. long.

GENERAL DISTRIBUTION: Reported only from the Antilles, with records from the Bahamas, Cuba, the Dominican Republic and Haiti, Jamaica, and the Lesser Antilles.

DISTRIBUTION IN LESSER ANTILLES: Barbuda, Antigua, Nevis, Guadeloupe and Barbados.

HABITAT: Open, dry grassland sites.

7. *Chloris cubensis* Hitchc. & Ekman ex Hitchc., U. S. D. A. Misc. Publ. 243: 131. 1936.

Type: *Ekman 14960*, Cuba, Prov. Oriente, Gamboa.

Tufted perennial, occasionally stoloniferous, with culms 50-60(-90) cm. tall. Sheaths glabrous. Ligule a glabrous or short-ciliate crown. Blades flat or folded, up to 15 cm. long and mostly 1.0-1.5 mm. broad, scabrous to sparsely pilose on adaxial surface, glabrous on abaxial surface. Inflorescence branches 3-7, mostly 5.5-8.5 cm. long, erect-spreading. Spikelets with a single reduced floret above the perfect one. Glumes narrow, lanceolate, unequal, the second 2.9-3.9 mm. long. Lemma of lower floret 3.1-3.6 mm. long, with a long-bearded callus and long-ciliate upper margins, the hairs to 1 mm. long; keel and sides of lemma sparsely pilose. Lemma awn 9-12 mm. long. Reduced floret narrow, cylindrical, 1.4-1.9 mm. long, with an obtuse apex and an awn 6-9 mm. long. Caryopsis about 1.3 mm. long.

GENERAL DISTRIBUTION: Known only from Cuba, Haiti, Puerto Rico, Jamaica and the Lesser Antilles.

DISTRIBUTION IN LESSER ANTILLES: Antigua, Guadeloupe, Barbados.

HABITAT: Dry, open, grassy areas.

Concerning relationships of this species to *C. sagraeana*, Anderson (in Brigham Young Univ. Sci. Bull., Biol. Series 19(2): 123. 1974) noted, "*Chloris cubensis* is similar to *C. sagraeana* from which it may be separated by its general larger size, less divergent mature spikes, and by the long hairs on the lemma margins and, usually, on the lemma keel."

22. EUSTACHYS Desvaux

Eustachys Desv. in Nouv. Bull. Sci. Soc. Philom. Paris 2: 188. 1810.

FIGURE 23a.

Cespitose, stoloniferous or rhizomatous perennials. Leaves glabrous, with laterally flattened and overlapping sheaths and flat or folded blades. Inflorescence of few to many digitate or subdigitate branches. Spikelets usually dark brown or nearly black, with one perfect floret below and one reduced,

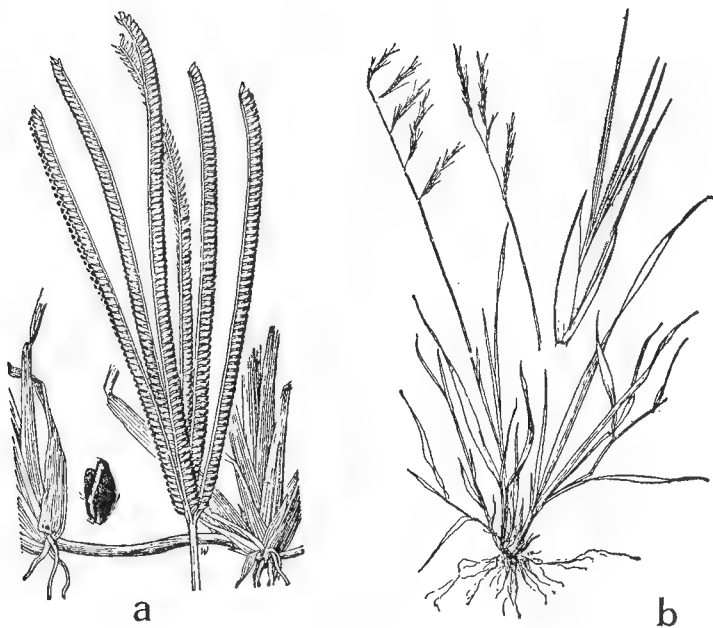


FIGURE 23. Poaceae. a, *Eustachys petraea*, inflorescence and culm bases in foreground, $\times 1$, and floret in background, $\times 5$. b, *Bouteloua americana*, habit (below), $\times 0.5$, and spikelet (above), $\times 5$. (Reprinted from Hitchcock, Manual of the grasses of the West Indies, p. 125, fig. 78, p. 139, fig. 87. 1936.)

neuter or staminate floret above. Glumes unequal, the first lanceolate, acute, the second nearly linear, bilobed at apex, with a short awn arising between the lobes. Lemma of perfect floret 3-nerved, short-awned at apex. Caryopses brown, with the embryo $\frac{1}{3}$ - $\frac{1}{2}$ the length of the endosperm.

TYPE SPECIES: *Chloris petraea* Swartz, now correctly known as *Eustachys petraea* (Swartz) Desv.

A genus of about 12 species, these widely distributed in tropical and subtropical regions of the world.

1. **Eustachys petraea** (Sw.) Desv. in Nouv. Bull. Sci. Soc. Philom. Paris 2: 189. 1810.

Basionym: *Chloris petraea* Swartz, Prodr. 25. 1788.

Type: Jamaica.

Perennial, often developing stolons. Culms 20-120 cm. tall. Ligule a short ciliate crown. Blades flat or folded, mostly 8-20 cm. long and 0.8-1.0 cm. broad, obtuse at apex. Panicles with 2-8 erect or erect-spreading branches 4-12 cm. long. Spikelets closely imbricated and widely divergent. First glume lanceolate, 0.9-1.5 mm. long, the second nearly linear, 1.1-1.7 mm. long, short-awned from the obtusely lobed apex. Lemma of perfect (lower) floret ovate-lanceolate, dark brown at maturity, 1.1-2.5 mm. long, pilose on upper $\frac{1}{2}$ - $\frac{3}{4}$ with short hairs, awnless or mucronate. Reduced floret cylindrical, truncate, 0.8-1.0 mm. long, awnless or mucronate.

GENERAL DISTRIBUTION: Southern United States, eastern Mexico and throughout the Antilles to Trinidad and northern South America.

DISTRIBUTION IN LESSER ANTILLES: Barbados.

HABITAT: Open, exposed sites, most frequent on and near the seashore.

23. **BOUTELOUA** Lagasca

Bouteloua Lag. in Var. Cienc. Lit. Art. 2(4): 134. 1805. FIGURE 23b.

Annuals and perennials, some with stolons or rhizomes. Leaves mostly basal, with rounded sheaths and linear blades. Ligule commonly a ring of hairs. Inflorescence with 1-numerous short, spicate branches, these solitary at the nodes and closely or distantly spaced on the main axis. Inflorescence branches with 1-numerous sessile spikelets in 2 rows along the margins of a flattened or angular rachis. Disarticulation above glumes or at base of branch rachis, the branch falling as a unit. Spikelets with 1 perfect floret and 1-3 staminate or sterile (often rudimentary) florets above. Glumes 1-nerved, usually lanceolate, awnless or short-awned. Lemma of lower floret 3-nerved, awnless or 1- to 3-awned, the lateral awns when present usually shorter than the terminal one. Palea membranous, the 2 nerves occasionally awn-tipped.

TYPE SPECIES: *Bouteloua curtipendula* (Michx.) Torr., based on *Chloris curtipendula* Michx.

A genus of 40 species, mostly in North and Central America but five species present in both North and South America and two with restricted ranges in South America.

KEY TO THE SPECIES

1. Inflorescence branches 15-35. 1. *B. vaneedenii*
- 1a. Inflorescence branches 1-13. 2
2. Upper floret typically neuter, reduced to a cylindrical awn column and 3 awns of equal or nearly equal length. 2. *B. americana*
- 2a. Upper floret well developed, staminate or neuter but not reduced to an awn column with 3 equal or nearly equal awns. 3. *B. repens*

1. *Bouteloua vaneedenii* Pilger ex Urban, Symb. Antill. 6: 2. 1909.

Type: *Boldingh 3512B*, Anguilla.

Cespitose perennial with numerous slender culms in a dense clump from a firm, knotty base. Culms (20-)30-40(-50) cm. tall. Ligule a fringe of hairs about 0.25 mm. long. Blades long, filiform and flexuous, 0.5-1.5 mm. broad, usually involute. Inflorescence with usually 15-35 branches, these with 1-5 (usually 2) spikelets. Disarticulation at base of branch. Spikelets 4-6 mm. long, with a single rudiment above the perfect floret. Glumes slightly unequal, the second 3.5-5.0 mm. long. Lemmas pale green, about as long as the second glume, the 3 nerves extended as mucrones or short awns. Rudiment minute to moderately well developed, the central awn to 2.5 mm. long. Anthers yellow.

GENERAL DISTRIBUTION: Cuba and Venezuela(?).

DISTRIBUTION IN LESSER ANTILLES: Anguilla (*Boldingh 3512B*, the type collection), St. Barthelemy.

HABITAT: On rocky, exposed coastal slopes.

Rare grass, known in the Caribbean area only from collections from the two Lesser Antillean Islands and Camaguey, Cuba. It also was reported from Venezuela by Hitchcock (Man. Grasses W. I. 138. 1936) on the basis of *Pittier 11338* (not examined by the writer).

2. *Bouteloua americana* (L. f.) Scribn. in Proc. Acad. Nat. Sci. Phila. 1891: 306. 1891.

Basionym: *Aristida americana* L. f., Pl. Jam. Pugill. 7. 1759; Syst. ed. 10. 879. 1759.

Type: *Patrick Browne*, Jamaica.

Syn.: *Aristida antillarum* Poir. in Lam., Encycl. Méth. Bot. Suppl. 1: 451. 1810. (Type: Antilles.)

Bouteloua elatior Griseb., Fl. Br. W. Ind. 537. 1864. (Type: *Wulfschlaegel 619* and 660, Antigua.)

Perennial but flowering in the first year and often appearing annual. Culms many-noded, mostly weak and decumbent or trailing, freely branch-

ing in age, from 8 cm. or less long in depauperate plants to more than 1 m. long in forms with vigorous, trailing culms. Sheaths shorter than the internodes. Blades mostly 2-4 mm. broad, glabrous or more commonly ciliate on lower margins with stiff, pustula-based hairs and occasionally sparsely hirsute on one or both surfaces. Inflorescence well exerted or partially included in upper sheath, with usually 5-12 slender, spicate branches mostly 1.5-4.0 cm. long. Spikelets slender, with a single reduced floret above the perfect one, mostly 5-10 per branch, typically widely spaced on, and appressed to, the rachis. Glumes glabrous, broad, acuminate or short-awned, acute, 3.5-5.0 (rarely up to 6.0) mm. long, the first slightly shorter than the second. Lemmas of lower floret short-awned, mostly 4.5-7.0 mm. long excluding the awns, with a tuft of white hairs at base. Palea narrow, as long as or longer than body of lemma, the 2 nerves extending as short awns. Upper floret typically reduced to a cylindrical awn column with three well-developed, equal or nearly equal awns that diverge from the same point.

GENERAL DISTRIBUTION: From the Bahama Islands, Cuba and the Yucatan Peninsula, south through the Caribbean and Central America to Colombia, Venezuela, and Brazil.

DISTRIBUTION IN LESSER ANTILLES: Anguilla, St. Martin, Antigua, Saba, St. Eustatius, St. Kitts, Nevis, Montserrat, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Grenada, Barbados.

HABITAT: Sandy beaches or sandy, open inland sites at low elevations.

3. *Bouteloua repens* (H.B.K.) Scribn. & Merr. in Bull. U. S. D. A. Div. Agrost. 24: 26. 1901.

Basionym: *Dineba repens* H.B.K., Nov. Gen. Sp. 1: 172, pl. 52. 1816.

Type: *Humboldt & Bonpland*, Mexico, Acapulco.

Syn.: *Heterosteca juncifolia* Desv. in Nouv. Bull. Sci. Soc. Philom. Paris 2: 188.

1810, non *Bouteloua juncifolia* Lag., 1816 (Type: "Habitat in Antilles.")

Bouteloua bromoides Lag., Gen. & Pl. Nov. 5. 1816. (Type: Mexico, Acapulco.)

Eutriana heterostega Trin., Gram. Unifl. 242. 1824, based on "*Heterostega juncifolia* Desv. et Kunth."

Bouteloua heterostega (Trin.) D. Griff. in Contr. U. S. Natl. Herb. 14: 414, fig. 59. 1912.

Plants perennial, with culms mostly 20-40 cm. tall, decumbent-spreading from a weak or firm base. Leaves glabrous or sparsely hirsute or hispid. Ligule a minute fringe of hairs. Blades flat, linear, 1-5 mm. broad, ciliate on margins near base. Inflorescence with 4-12 short, evenly spaced branches, these bearing usually 3-9 spikelets. Disarticulation at base of branch. Spikelets 2-flowered, the lower perfect, the upper staminate or sterile, rarely perfect. Rachilla often extended as a short awn. First glume 4-7 mm. long, the second slightly longer. Lemma of lower floret 4.5-8.0 mm. long, glabrous or infrequently bearded at base, awnless or the nerves occasionally short-awned. Palea of lower floret narrow, often slightly longer

than body of lemma, awnless or minutely 2-awned. Upper floret well developed, often broader than lower floret, usually staminate, the lemma with a membranous body and 3 awns, the central awn mostly 4-8(-10) mm. long, the lateral awns shorter and more slender. Anthers 3.0-4.5 mm. long. Caryopsis narrowly oblong.

GENERAL DISTRIBUTION: Southern Texas, New Mexico and Arizona, south through Mexico, Central America and the Caribbean Islands to Venezuela and Colombia.

DISTRIBUTION IN LESSER ANTILLES: St. Martin.

HABITAT: Sandy shores and along ditches and road rights of way.

24. CYNODON L. Richard

Cynodon L. Rich. in Pers., Syn. Pl. 1: 85. 1805.

FIGURE 24.

Perennials, usually mat-forming, with stolons and rhizomes. Culms wiry, much-branched, usually with numerous, short internodes. Ligule a fringe of hairs. Blades flat or folded, short, narrow. Inflorescence with 2-several slender, spicate branches digitately arranged at the culm apex. Spikelets sessile in two rows on a narrow branch rachis. Spikelets with a perfect floret below and occasionally a scalelike rudiment above on a bristlelike extension of the rachilla. Glumes 1-nerved, awnless. Lemma 3-nerved, awnless. Palea well developed.

TYPE SPECIES: *Panicum dactylon* L., now correctly known as *Cynodon dactylon* (L.) Pers.

A genus of about ten species, these mostly in Africa and Australia but one species, *Cynodon dactylon*, frequent throughout the warmer parts of the world.

1. *Cynodon dactylon* (L.) Pers., Syn. Pl. 1: 85. 1805.

Basionym: *Panicum dactylon* L., Sp. Pl. 58. 1753.

Type: Europe.

Syn.: *Capriola dactylon* (L.) Kuntze, Rev. Gen. Pl. 2: 764. 1891.

Flowering culms numerous, mostly 10-50 cm. tall, arising from extensive system of wiry, many-noded, prostrate stoloniferous culms and firm, branching rhizomes. Sheaths rounded on back, glabrous except for tufts of hair on either side of collar. Hairs of ligule 0.2-0.5 mm. long. Blades mostly 3-8(-14) cm. long and 1-3(-4) mm. broad. Inflorescence with usually (2-) 3-5(-7) slender, digitate branches mostly 2-6 cm. long. Spikelets 1-flowered, disarticulating above the glumes. Glumes lanceolate, slightly unequal, the second about $\frac{2}{3}$ as long as the lemma. Lemmas mostly 2.0-2.5 mm. long, firm, shiny, laterally compressed, 3-nerved, the lateral nerves near the margins, the midnerve obscurely pubescent or scabrous. Palea narrow, slightly shorter than lemma, with 2 closely placed nerves.

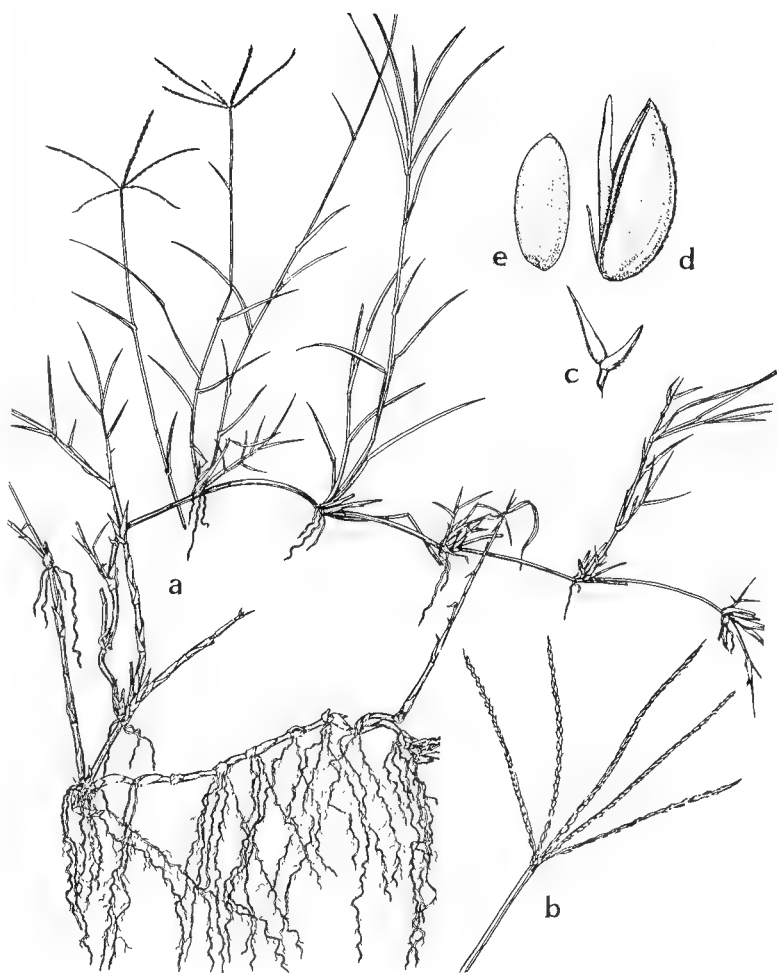


FIGURE 24. Poaceae. a-e, *Cynodon dactylon*: a, culms arising from rhizome, $\times 0.1$; b, inflorescence, $\times 0.5$; c, glumes, $\times 1$; d, floret, $\times 2$; e, spikelet, $\times 2$. (Reprinted from Gould, Grasses of the Texas Coastal Bend, p. 56, fig. 51. 1965.)

GENERAL DISTRIBUTION: Widespread throughout the warmer parts of the world.

DISTRIBUTION IN LESSER ANTILLES: St. Martin, Antigua, St. Eustatius, St. Kitts, Montserrat, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Grenada, Barbados.

HABITAT: A commonly cultivated lawn and pasture grass, frequent as a weed of ditches, wasteplaces, roadways and moist streambanks.

25. SPARTINA Schreber

Spartina Schreb. in Gmel., Syst. Nat. ed. 13. 2: 123. 1791. FIGURE 25.

Perennials with firm, often tall and coarse culms densely clumped and without rhizomes or in small clumps or solitary from short or long rhizomes. Leaves usually tough and firm, the blades long, flat or involute. Ligule a dense ring of hairs. Inflorescence with few to numerous, racemously arranged branches, the branches short, usually appressed, unbranched, bearing closely placed, sessile, 1-flowered spikelets. Disarticulation below glumes. Glumes unequal, keeled, usually 1-nerved but occasionally the second with 2-3 closely placed nerves. Lemmas firm, keeled, strongly 1- or 3-nerved and often with indistinct lateral nerves, tapering to a rounded but narrow, awnless tip. Paleas as long as or longer than lemmas, with 2 closely placed nerves.

TYPE SPECIES: *Spartina schreberi* Gmel. has long been regarded as the type of the genus, but the name was never validly published. In 1956, Mobberley (in Iowa St. Coll. Jour. Sci. 30: 477) designated *Spartina cynosuroides* (L.) Roth (based on *Dactylis cynosuroides* L.) as the type species.

A genus of about 16 species, one native to Europe, the others American.

KEY TO THE SPECIES

1. Inflorescence branches 9 or more; blades mostly 5-12 mm. broad. 1. *S. alterniflora*
- 1a. Inflorescence branches mostly 2-7; blades 1-4 mm. broad. 2. *S. patens*

1. *Spartina alterniflora* Loisel., Fl. Gall. 719. 1907.

Type: France, Bayonne.

Culms mostly 1-2 m. tall, solitary or in small clusters from thick but soft, whitish rhizomes. Lower sheaths broad and inflated. Ligular hairs 1-2 mm. long. Blades mostly 5-12 mm. broad, the broader blades flat at least near the base. Panicles 15-35 cm. long, with 9-20 appressed branches on a stout axis 5-15 cm. long. Spikelets 8-14 mm. long. Glumes glabrous, awnless or abruptly apiculate, the first glume usually about $\frac{1}{2}$ as long as the second. Lemmas glabrous, slightly shorter than the paleas. Anthers mostly 4-6 mm. long.



FIGURE 25. Poaceae. a, b, *Spartina alterniflora*: a, inflorescence, $\times 0.7$; b, spikelet, $\times 4$. (Reprinted from Gould, Grasses of the Texas Coastal Bend, p. 152, fig. 157. 1965.)

GENERAL DISTRIBUTION: This species grows along the North American coast from Newfoundland to Florida and Texas, and on the eastern coast of South America. It is present along the coasts of England and France, where it may be introduced.

DISTRIBUTION IN LESSER ANTILLES: Known from a single collection, *Perrotet s.n.* (GH) from Guadeloupe.

HABITAT: Coastal tideflats and brackish marshes, usually in areas periodically inundated by saline water.

An interesting characteristic of this species is the strong and somewhat disagreeable odor of the fresh, crushed herbage. This odor persists for some time on herbarium specimens.

2. *Spartina patens* (Ait.) Muhl., Disc. Gram. 55. 1817.

Basionym: *Dactylis patens* Ait., Hort. Kew. 1: 104. 1789.

Type: Grown in England from North American seed.

Culms usually solitary or in small clusters from creeping rhizomes. Blades 1-2(-4) mm. broad, tightly involute on drying. Inflorescence usually with 2-5 branches, these slender, 3-8 cm. long. Spikelets mostly 7-12 mm. long. Glumes awnless, scabrous on the nerve, the first glume usually less than $\frac{1}{2}$ the length of the second, the second as long as the spikelet. Lemmas and paleas blunt, the palea slightly longer than the lemma.

GENERAL DISTRIBUTION: Along the eastern coast of North America from Quebec south to Mexico and Central America, and throughout the Caribbean. Also collected at inland regions in New York and Michigan. This species is known from southern France, Corsica, and Italy, where it probably is adventive.

DISTRIBUTION IN LESSER ANTILLES: St. Martin, Antigua, Guadeloupe.

HABITAT: Most commonly on open beaches, sandy flats and low dunes.

26. TRAGUS A. Haller

Tragus Hall., Hist. Stirp. Helv. 2: 203. 1768, nom. cons. FIGURE 26.

Tufted annuals with weak stems, flat blades and spicate inflorescences of burrlike clusters of 2-5 one-flowered spikelets. Ligule a ring of short hairs on a membranous collar. Disarticulation at base of each spikelet cluster. First glume small, thin, much reduced or wanting. Second glume of the lower 2 spikelets of a cluster large, firm, and with 3 rows of stout, hooked spines. Lemmas of the lower spikelets thin and flat. Upper 1-3 spikelets neuter, the uppermost usually rudimentary.

TYPE SPECIES: *Cenchrus racemosus* L., now correctly known as *Tragus racemosus* (L.) All.

A genus of three species, these weedy annuals of the warm regions of the world but possibly native to North America or the Caribbean.

1. *Tragus berteronianus* Schult., Mant. 2: 205. 1824.

Type: Dominican Republic, Santo Domingo.

Culms geniculate, spreading, 5-30(-40) cm. long. Sheaths rounded on back, usually shorter than culm internodes, glabrous or with a few long hairs on either side of the collar. Ligule 0.5-1.0 mm. long. Blades mostly 3-10 cm. long and 1.5-5.0 mm. broad, usually with whitish, coarsely hispid-ciliate margins. Inflorescence (2-)4-9(-12) cm. long and 5-7 mm. thick, the spinescent spikelet clusters short-pedunculate and closely clustered on the rather stout, hispid inflorescence axis. Peduncle of burr mostly 0.3-0.4 mm. long, the spikelets 2-3 mm. long.

GENERAL DISTRIBUTION: Texas to Arizona and south through the Antilles to Argentina; also in the warmer parts of the Old World. There is some question whether this species is native to the New World.

DISTRIBUTION IN LESSER ANTILLES: Anguilla, St. Martin, St. Barthelemy, Antigua, Saba, St. Eustatius, St. Kitts, Montserrat, Guadeloupe, Dominica, St. Vincent, Grenada, Barbados.

HABITAT: On open, dry ground, often weedy in aspect.

27. PAPPOPHORUM Schreber

Pappophorum Schreb. in Vahl, Symb. Bot. 3: 10. 1794. FIGURE 26.

Cespitose perennials with moderately tall, erect culms; long, flat or involute blades and narrow, contracted, bristly panicles. Ligule a ring of hairs. Spikelets 3- to 6-flowered but only the lower 1-3 perfect. Disarticulation above the glumes, the florets falling together. Glumes subequal, thin, 1-nerved. Lemmas firm, rounded on the back, indistinctly many-nerved, the nerves extending into awns of unequal length. Paleas about as long as body of lemmas.

TYPE SPECIES: *Pappophorum alopecuroideum* Vahl.

A genus of seven species occurring in southern North America and South America; one species, *P. pappiferum*, ranges northward through the Antilles to Cuba.

1. *Pappophorum pappiferum* (Lam.) Kuntze, Rev. Gen. Pl. 3(2): 365. 1898.

Basionym: *Saccharum pappiferum* Lam., Tabl. Encycl. Méth. Bot. 1: 155. 1791.

Type: South America; type in Lamarck Herbarium (p) *vide* Hitchcock, Man. Grasses W. I. 60. 1936.

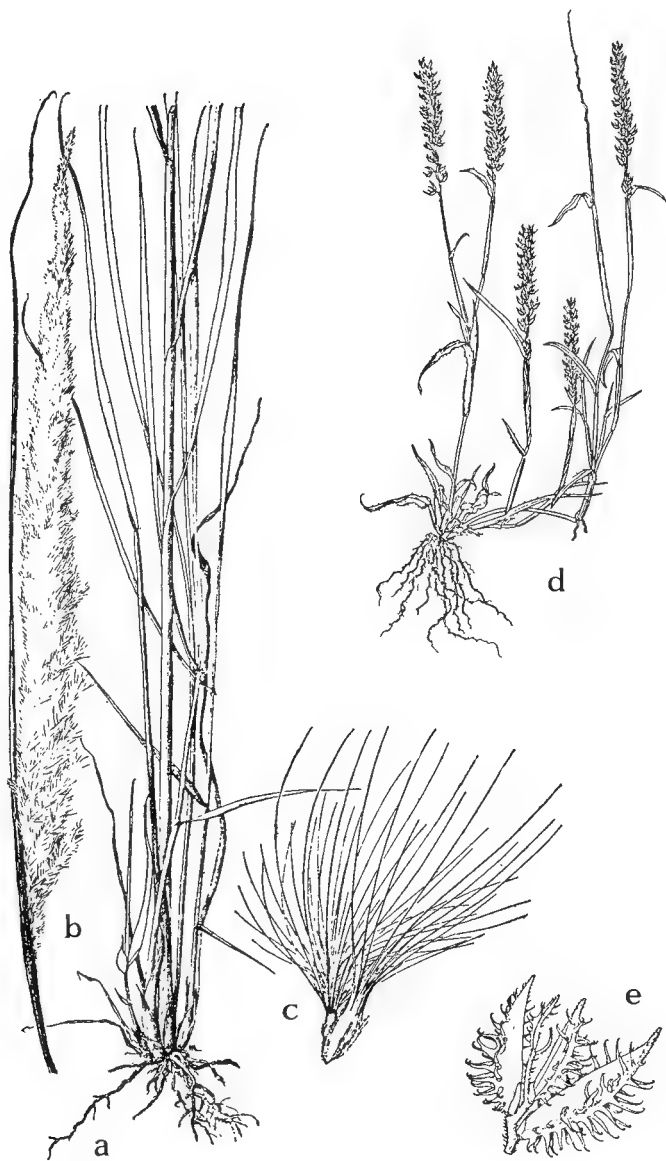


FIGURE 26. Poaceae. a-c, *Pappophorum pappiferum*: a, culm bases, $\times 0.5$; b, inflorescence, $\times 0.5$; c, spikelet, $\times 10$. d, e, *Tragus berteronianus*: d, habit, $\times 0.2$; e, spikelet cluster, $\times 10$. (a-c, reprinted from Hitchcock, Manual of the grasses of the West Indies, p. 60, fig. 33. 1936; d, e, reprinted from Gould, Grasses of Southwestern United States, p. 157, fig. 43. 1951.)

Coarse perennial with firm or stout culms to 1 m. or more tall from a hard base. Sheaths rounded, glabrous or with soft hairs on the upper margins. Ligule a fringe of hairs 2-5 mm. long. Blades elongate, narrow and involute on drying, seldom over 4 mm. broad. Inflorescence light-colored, tightly contracted, mostly 10-40 cm. long and 8-12 mm. thick. Lemmas bristly with 11 or more awns of irregular lengths, some 5-8 mm. or more long. Body of lower lemmas about 2 mm. long.

GENERAL DISTRIBUTION: Southern Mexico to South America and south from Cuba throughout the Antilles.

DISTRIBUTION IN LESSER ANTILLES: St. Martin, Antigua, Saba, St. Eustatius, St. Kitts, Redonda, Guadeloupe, Dominica, Martinique.

HABITAT: Brushy hills and road rights of way.

28. ARISTIDA Linnaeus

Aristida L., Sp. Pl. 82. 1783.

FIGURE 27.

Tufted, low to moderately tall annuals and perennials of varied habit but typically without rhizomes or stolons. Ligule a ring of hairs or a minute, ciliate membrane. Blades long and narrow, usually involute. Inflorescence an open or contracted panicle of usually large, 1-flowered spikelets. Disarticulation above glumes. Glumes large, thin, 1-nerved or occasionally 3-nerved. Lemma indurate, terete, indistinctly 3-nerved, with a hard, sharp-pointed callus at base, tapering gradually or, less frequently, abruptly to an awn column bearing usually 3 well-developed awns, the lateral awns partially or totally reduced in some species. Caryopses long and slender, permanently enclosed by the firm lemmas.

TYPE SPECIES: *Aristida adscensionis* L.

Species about 200, throughout the warmer parts of the world, mostly in the subtropics.

KEY TO THE SPECIES

- | | | |
|-----|---|---------------------------|
| 1. | Plants annual, culms spreading-erect. | 1. <i>A. adscensionis</i> |
| 1a. | Plants perennial. | 2 |
| 2. | Culms spreading at base; blades 5-15 cm. long; lemma with awns 10-15 mm. long. | 2. <i>A. cognata</i> |
| 2a. | Culms erect at base; blades to 30 cm. long; lemma with awns 15-25 mm. long. | 3. <i>A. swartziana</i> |

1. *Aristida adscensionis* L., Sp. Pl. 82. 1753.

Type: Adscension Island.

Syn: *Aristida maritima* Steud., Syn. Pl. Glum. 137. 1855. (Type: Guadeloupe.)

Tufted annual, much-branched at base, extremely variable in size and growth habit, with flowering culms usually 15-50 cm. long but occasionally

ranging from less than 10 to 80 or more cm. tall. Culms wiry, erect and unbranched above base or geniculate, spreading and freely branched. Sheaths short, rounded on back, glabrous. Ligule a fringed membrane 0.5-1.0 mm. long. Blades flat or involute, 1.0-2.5 mm. broad, scabrous to finely hispid on adaxial surface. Panicles contracted, usually interrupted, extremely variable in length but usually 6-15 cm. long, with spikelets aggregated on short, widely spaced branches. Glumes unequal to nearly equal, the first 4-8 mm. long, the second slightly longer. Lemmas thick, straight (untwisted), 5-9 mm. long to base of awns, usually scabrous in lines. Lemma awns scabrous, slightly flattened below, spreading at a narrow angle, the central awn 7-15(-20) cm. long, the lateral awns about equal to or much shorter than the central awn.

GENERAL DISTRIBUTION: Western Missouri to Texas and California, the Antilles and south through South America; also in Africa.

DISTRIBUTION IN LESSER ANTILLES: Anguilla, Antigua, Nevis, Guadeloupe, Montserrat, Martinique, Grenada.

HABITAT: A weed of open, sandy soils and disturbed habitats.

2. *Aristida cognata* Trin. & Rupr. in Mem. Acad. St. Petersburg. VI Sci. Nat. 5: 127. 1842.

Type: Virgin Islands, St. Thomas.

Tufted perennial with slender, curving-erect culms 20-40 cm. tall. Leaves glabrous except for lateral tufts of hairs on the collar, the hairs up to 1 mm. long. Blades 5-15 mm. long, filiform, usually involute, not over 1 mm. broad. Panicles narrow, nearly simple, with erect, short-pedicel spikelets. Glumes unequal, the first 4-6 mm. long, the second 1-2 mm. longer. Lemma 6-7 mm. long, gradually tapering to base of awns. Awns spreading, 10-15 mm. long.

GENERAL DISTRIBUTION: Cuba and the Virgin Islands.

DISTRIBUTION IN LESSER ANTILLES: Reported from Montserrat by Hitchcock on the basis of *Shafer 48* (US) and *430* (NY, US). In the opinion of the writer, who has examined the cited specimens, the Shafer collections probably should be referred to the common and widespread *A. adscensionis*.

HABITAT: Dry hillsides.

3. *Aristida swartziana* Steud., Syn. Pl. Glum. 1: 137. 1854.

Type: Jamaica.

Tufted perennial with culms 40-70 cm. tall. Blades filiform, involute, as much as 30 cm. long and about 1 mm. broad. Panicles narrow, loose and interrupted, mostly 10-15 cm. long and with ascending branches 1-3 cm. long. First glume about 7 mm. long, the second slightly longer. Lemma 7-8 mm. long. Awns about equal in length, mostly 15-25 mm. long.

GENERAL DISTRIBUTION: Jamaica and Haiti.

DISTRIBUTION IN LESSER ANTILLES: Reported only from Antigua, Box 38 and 62.

29. ARUNDINELLA Raddi

Arundinella Raddi, *Agrost. Bras.* 36, *tab. 1, fig. 3.* 1823. FIGURE 27.

Mostly robust perennials with long narrow blades and large, open or contracted panicles. Spikelets small, numerous, short-pediceled, 2-flowered, the upper floret perfect, the lower staminate or neuter. Glumes well developed, acute to acuminate, more or less persistent, membranous or coriaceous, the upper as long as the spikelet, the lower shorter. Lemma of upper floret similar to the glume, smaller than lemma of lower floret, bearded on the callus, more or less terete, often awned from an entire or 2-lobed tip, the awn usually geniculate and twisted below the joint.

TYPE SPECIES: *Arundinella brasiliensis* Raddi.

A genus of about 55 species, mainly in tropical Asia and the Americas.

KEY TO THE SPECIES

1. Awns 2-5 mm. long, tightly twisted below the bend. 1. *A. confinis*
- 1a. Awns 8-12 mm. long, not twisted. 2. *A. berteroniana*

1. *Arundinella confinis* (Schult.) Hitchc. & Chase in Contr. U. S. Natl. Herb. 18: 290. 1917.

Basionym: *Piptantherum confine* Schult., *Mant.* 2: 184. 1824.

Type: Martinique, Sieber 265.

Syn.: *Arundinella martinicensis* Trin., *Gram. Pan.* 62. 1826. (Type: Martinique, Sieber 262.)

Tall, erect perennial with culms mostly single or few in a cluster, up to 2.5 m. tall. Sheaths rounded, glabrous. Ligule a ring of hairs 2-3 mm. long. Blades firm, lanceolate, glabrous, scabrous or sparsely hispid, nodulose-roughened on adaxial surface, mostly 6-12 mm. broad. Panicle narrow, elongate, mostly 20-40 cm. long. Awn of upper (perfect) lemma 3-5 mm. long above bend, and about 1.5 mm. below bend, the lower section tightly twisted.

GENERAL DISTRIBUTION: Trinidad and Tobago, and southern Mexico to Paraguay.

DISTRIBUTION IN LESSER ANTILLES: Dominica, Guadeloupe, Martinique, St. Vincent.

HABITAT: Moist depressions and seeps along cliffs and moist banks.

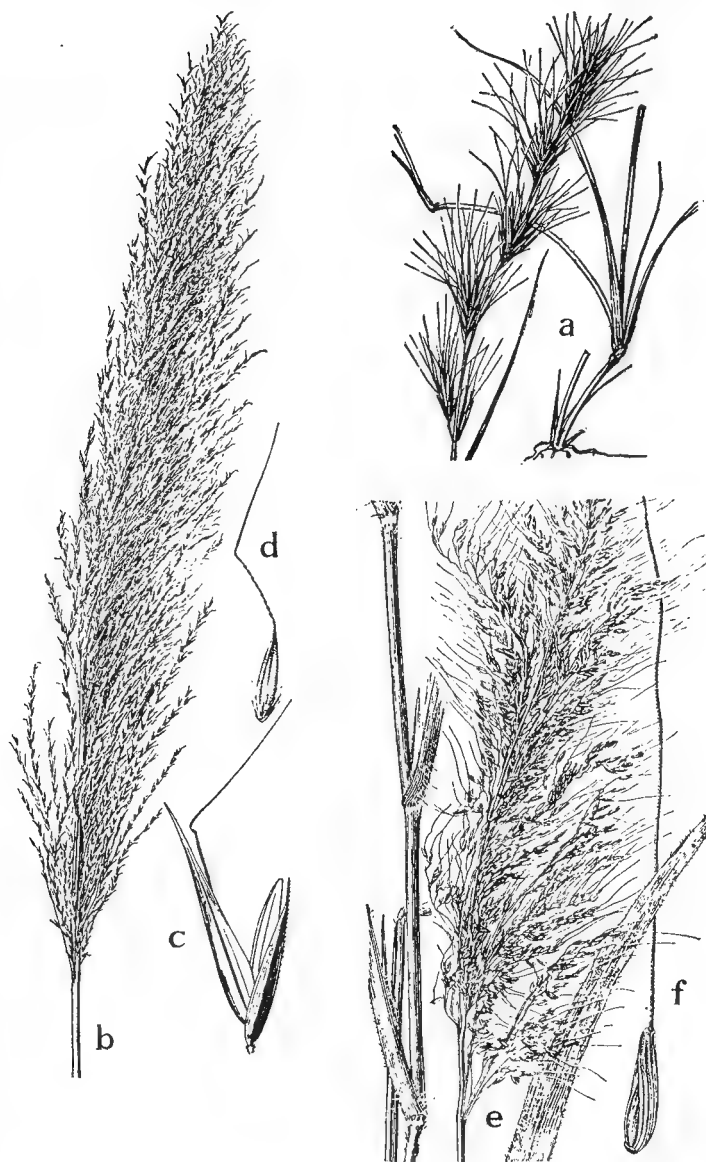


FIGURE 27. Poaceae. a, *Aristida adscensionis*, $\times 1$. b-d, *Arundinella confinis*: b, inflorescence, $\times 0.5$; c, spikelet, $\times 10$; d, floret, $\times 10$. e, f, *Melinis minutiflora*: e, inflorescence and culm, $\times 1$; f, spikelet, $\times 10$. (Reprinted from Hitchcock, Manual of the grasses of the West Indies, p. 89, fig. 53, p. 155, fig. 99, p. 160, fig. 102. 1936.)

2. *Arundinella berteroniana* (Schult.) Hitchc. & Chase in Contr. U. S. Natl. Herb. 18: 290. 1917.

Basionym: *Trichochloa berteroniana* Schult., Mant. 2: 209. 1824.

Type: Dominican Republic, Santo Domingo.

Syn.: *Muhlenbergia berteroniana* Kunth, Rev. Gram. 1: 64. 1829.

Tufted perennial with culms mostly 40-80, occasionally 100 cm. tall. Culm nodes appressed-pubescent. Sheaths mostly glabrous but ciliate on margins and often with hairs on collar and throat. Ligule a short, ciliate ring of hairs. Blades commonly 10-20 cm. long and 2-5 mm. broad, usually sparsely papillose-hispid. Panicle 10-30 cm. long, often lax and somewhat open, the branches floriferous to near base. Spikelets 4-5 mm. long, with a slender lemma awn 8-12 mm. long, this undulant and curved, untwisted, with a loose bend below the middle.

GENERAL DISTRIBUTION: Mexico and Central America to Brazil.

DISTRIBUTION IN LESSER ANTILLES: St. Martin ("*Flora Martin. Nro. 264*").

HABITAT: Moist banks and seeps, often along streamcourses.

This is the first report of *A. berteroniana* in the Lesser Antilles. Hitchcock (Man. Grasses W. I. 157. 1936) records it from Cuba, Haiti and the Dominican Republic.

30. MELINIS Beauvois

Melinis Beauv., Ess. Agrost. 54, pl. 11, f. 4. 1812.

FIGURE 27.

Annuals and perennials, mostly with thin, flat blades. Ligule a fringe of hairs. Inflorescence an open or contracted, many-flowered panicle, with numerous, small spikelets that readily disarticulate from the short, slender pedicels. Spikelets 2-flowered, the upper floret perfect, the lower neuter. Glumes unequal, the lower minute, the upper as long as the spikelet, notched at the apex and often with a minute awn from between the lobes. Lemma of lower floret usually slightly shorter and narrower than upper glume, usually with a long, threadlike awn from between the apical lobes.

TYPE SPECIES: *Melinis minutiflora* Beauv.

A genus of about 20 species, these restricted to Africa except for *M. minutiflora*.

1. *Melinis minutiflora* Beauv., Ess. Agrost. 54, pl. 11, f. 4. 1812.

Type: Brazil. "Croit a Rio-Janeiro." Hitchcock (1936) notes, "Described from Brazil where, however, it appears to be introduced."

Plants coarse, the culms 0.8-1.5 m. or more long, often decumbent and rooting at lower nodes, apparently annual in the New World but African plants reported as perennial. Herbage pubescent, usually glandular-viscid and strongly scented, the culm nodes densely bearded. Blades linear, mostly

10-20 cm. long and 6-10 mm. broad. Panicles narrow, 15-30 cm. long, densely flowered, with numerous, slender branches. Spikelets 1.8-2.3 mm. long excluding the awn. First glume a minute scale. Second glume strongly 5-nerved, notched at apex. Lemma of lower floret 5-nerved, with a slender awn 10-15 mm. long from between 2 narrowly acute or acuminate apical teeth, rarely awnless. Upper floret with thin, awnless, often translucent lemma and palea.

GENERAL DISTRIBUTION: Native to Africa, now widespread in tropical America and considered by some to be indigenous there.

DISTRIBUTION IN LESSER ANTILLES: Dominica, Guadeloupe and Martinique; probably introduced elsewhere as a forage plant.

HABITAT: Often grown as a forage plant, occasional as a weed of roadsides and other disturbed areas.

31. RHYNCHELYTRUM Nees von Esenbeck

Rhynchelytrum Nees in Lindl., Nat. Syst. ed. 2. 446. 1836. FIGURE 28.

Cespitose annuals and perennials with linear or filiform blades. Ligule a fringe of hairs. Inflorescence a loosely contracted panicle with usually numerous, small, readily deciduous, 2-flowered spikelets, these usually silky-villous with bright colored hairs but occasionally glabrous. Spikelets laterally compressed, the first glume minute to about $\frac{1}{2}$ the length of the spikelet, the second glume and lemma of lower floret about equal, often divergent above, awnless or awned at the notched apex.

TYPE SPECIES: *Rhynchelytrum dregeanum* Nees, now correctly known as *R. repens* (Willd.) C. E. Hubb.

A genus of about 40 species, mostly African, one in India and one in Indo-China.

1. *Rhynchelytrum repens* (Willd.) C. E. Hubb. in Kew Bull. 1934: 110. 1934.

Basionym: *Saccharum repens* Willd., Sp. Pl. 1: 322. 1797.

Type: South Africa.

Syn.: *Tricholaena rosea* Nees, "Cat. Sem. Hort. Vratisl. a. 1836"; Fl. Afr. Austr. 1: 17. 1841.

Tricholaena repens (Willd.) Hitchc., in U. S. D. A. Misc. Publ. 243: 331. 1936.

Tufted annual or weak perennial with weak, geniculate-erect culms mostly 0.7-1 m. tall. Culm nodes puberulent, the herbage otherwise hispid to nearly glabrous. Ligule a fringe of hairs 0.5-1.0 mm. long. Blades flat, mostly 8-18 cm. long and 2-5 mm. broad. Inflorescence a loosely contracted panicle 6-12 cm. long, with slender, short, curving and undulant branchlets and pedicels. Spikelets 3.5-4.0 mm. long. First glume minute. Second glume and lemma of lower floret about equal, silky-villous with long purplish hairs to near apex, the tips notched and minutely awned. In age the hairs



FIGURE 28. Poaceae. a-d, *Rhynchelytrum repens*: a, culm base, $\times 0.5$; b, inflorescence, $\times 0.5$; c, spikelet, $\times 10$; d, floret, $\times 10$. (Reprinted from Hitchcock, Manual of the grasses of the West Indies, p. 333, fig. 304. 1936.)

of the spikelets fading to almost white. Lemma of upper floret much shorter than second glume and lemma of lower floret, narrow, membranous, glabrous, with thin margins, these not inrolled over the palea.

GENERAL DISTRIBUTION: Native to Africa, now widespread throughout the warmer parts of the Americas.

DISTRIBUTION IN LESSER ANTILLES: Anguilla, Antigua, Barbados, Guadeloupe, St. Kitts, St. Lucia, St. Martin, St. Vincent.

HABITAT: Frequent on open roadsides and in wastelands.

32. ISACHNE R. Brown

Isachne R. Br., Prodr. Fl. Nov. Holl. 1: 196. 1810.

FIGURE 29.

Plants mostly perennial, with firm, often somewhat woody culms from 15 or 20 cm. long to 2 m. or more tall. Several species with culms decumbent and creeping or climbing and trailing. Ligule a ring of short hairs. Leaves lanceolate, tapering to an acute or acuminate apex. Inflorescence a small to moderately large panicle with spreading branches and small spikelets. Spikelets with 2 essentially similar florets, the upper perfect, the lower perfect or staminate. Both florets plano-convex, rounded at apex, and with firm or hard lemmas and paleas. Glumes long and broad, about equal in length, often deciduous before the florets disarticulate. Florets often disarticulating together, attached by the short, stout rachilla.

TYPE SPECIES: *Isachne australis* R. Br.

Species about 60, in the warmer areas of both hemispheres.

KEY TO THE SPECIES

1. Leaves (at least some) 8 cm. or more long and 5 mm. or more broad. 2
- 1a. Leaves mostly 3-6 cm. long and 3-4 (rarely to 5) mm. broad. 4
2. Glumes pubescent; blades mostly 8-15 cm. long and 5-12 mm. broad. 1. *I. angustifolia*
- 2a. Glumes glabrous or obscurely pubescent at tip; blades mostly more than 15 cm. long and often more than 15 mm. broad. 3
3. Spikelets clustered at the tips of panicle branches and branchlets. 2. *I. arundinacea*
- 3a. Spikelets not clustered at the panicle branch tips, the panicle appearing loosely and relatively uniformly flowered. 3. *I. disperma*
4. Leaf blades thick, with a prominent, raised midnerve, corky margins and pungent tip. 4. *I. rigidifolia*
- 4a. Leaf blades thin, the midnerve faint or obscure, the margins not thickened, the tip pointed but not pungent. 5. *I. rigens*

1. *Isachne angustifolia* Nash in Bull. Torrey Bot. Club 30: 377. 1903.

Type: Puerto Rico, *Wilson 160*.

Culms to 2 m. or more long, typically freely branching at the upper nodes and trailing over shrubs, cliffs and ditch banks. Ligule a ring of hairs less than 0.5 mm. long. Blades lanceolate, glabrous or scabrous, mostly 6-15 cm. long and 5-12 mm. broad, firm and stiffly spreading. Panicles open, with spreading branches, mostly 10-15 cm. long. Panicle branches loosely flowered nearly to base. Spikelets 1.2-1.5 mm. long. Glumes sparsely puberulous on upper half, about equal in length and nearly as long as spikelet, often deciduous before the florets disarticulate.

GENERAL DISTRIBUTION: Puerto Rico.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe, Martinique, St. Kitts.

HABITAT: On rocky slopes, often trailing over shrubs.

2. *Isachne arundinacea* (Sw.) Griseb., Fl. Br. W. Ind. 553. 1864.

Basionym: *Panicum arundinaceum* Sw., Prodr. 24. 1788.

Type: Jamaica.

Culms often climbing and branching over the branches of shrubs, up to 2 m. or more long. Sheaths glabrous or scabrous, ciliate on the margins, sometimes papillose-hispid at the apex. Ligule a ring of stiff hairs to 5 mm. long. Blades often 15-20 cm. long and 2 cm. broad, tapering to a narrowly acute apex. Panicles ovoid or pyramidal, mostly 6-8(-12) cm. long, the spikelets mostly aggregated around the periphery, the main lower branches bare of spikelets on the lower half. Spikelets 1.5-1.8 mm. long, with broad, faintly nerved glumes of equal length and slightly shorter than the florets, the glume tips glabrous or with a few stiff hairs.

GENERAL DISTRIBUTION: Jamaica, Trinidad, and Mexico to Bolivia.

DISTRIBUTION IN LESSER ANTILLES: St. Kitts, Guadeloupe, Grenada.

HABITAT: Brushy slopes, usually associated with shrubs and often climbing or trailing over the branches.

This species appears very close to *I. disperma* and the two may not be specifically distinct.

3. *Isachne disperma* (Lam.) Doell in Mart., Fl. Bras. 2(2): 274. 1877.

Basionym: *Panicum dispernum* Lam., Tabl. Encycl. M  th. Bot. 1: 173. 1791.

Type: Tropical America.

Similar in general aspect to *I. arundinacea* but blades averaging larger, to 2.5 cm. broad, panicles larger, usually 15-20 cm. long, the spikelets averaging slightly smaller, mostly 1.2-1.4 mm. long, and not clustered at the branch tips.

GENERAL DISTRIBUTION: Endemic to the Lesser Antilles and Tobago.



FIGURE 29. Poaceae. *Isachne arundinacea*, culm base (below) and inflorescence (above), $\times 0.5$. (Reprinted from Hitchcock, Manual of the grasses of the West Indies, p. 321, fig. 294. 1936.)

DISTRIBUTION IN LESSER ANTILLES: Dominica, Grenada, Guadeloupe, St. Kitts, Martinique, Montserrat, St. Lucia, St. Martin, St. Vincent, Nevis.

HABITAT: Wooded hillsides.

4. *Isachne rigidifolia* (Poir.) Urban, Symb. Antill. 4: 85. 1903.

Basionym: *Agrostis rigidifolia* Poir. in Lam., Encycl. Méth. Bot. Suppl. 1: 257. 1810.

Type: Dominican Republic, Santo Domingo.

Plants decumbent-creeping, often forming large mats, the erect culms 15-40 cm. tall. Leaves imbricate and decussate on the leafy branches, the sheaths strongly nerved, densely fringed on the margins. Ligule a minute, lacerate or ciliate membrane. Blades stiff and spreading, glabrous, with prominent midnerve and margins, 3-6 cm. long and usually 3-4 (rarely 5) mm. broad, with a firm, pungent tip. Panicles narrow but open, few-flowered, mostly 2-5 cm. long. Spikelets 1.5-2 mm. long, glabrous.

GENERAL DISTRIBUTION: Endemic to the Antilles.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe, Martinique, St. Kitts.

HABITAT: Boggy areas and exposed ridges.

5. *Isachne rigens* (Sw.) Trin., Gram. Pan. 252. 1788.

Basionym: *Panicum rigens* Sw., Prodr. 23. 1788.

Type: Jamaica.

Similar to *I. rigidifolia* in general habit and spikelet characters, the prostrate-spreading culms to 2 m. in length with erect flowering culms 10-30 cm. long. Leaves about as in *I. rigidifolia* but thinner, less strongly nerved and with an inconspicuous midnerve and only slightly thickened margins.

GENERAL DISTRIBUTION: Jamaica, Venezuela and Ecuador.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe, Saba.

HABITAT: Boggy areas and moist cliffs in mountains.

33. DIGITARIA Heister

Digitaria Heister in Scop., Fl. Carn. ed. 2. 1: 52. 1772. FIGURE 30.

Annuals and perennials, many with decumbent-spreading culms. Ligules membranous. Blades commonly thin and flat. Inflorescence a panicle with few to numerous, slender, spicate branches, these unbranched or sparingly branched near base, with spikelets subsessile or short-pedicel in two rows on a flat or 3-angled, often winged rachis. Spikelets 2-flowered, the upper floret perfect, the lower staminate or neuter. Disarticulation below glumes. First glume minute or absent. Second glume well developed but usually shorter than lemma of lower floret. Lemma of upper floret narrow,

acute or acuminate, firm but not hard, the margins thin and flat, not inrolled over palea.

TYPE SPECIES: *Digitaria sanguinalis* (L.) Scop., based on *Panicum sanguinalis* L.

A genus of about 300 species, distributed in temperate and tropical regions of both hemispheres. The species of *Digitaria* have been variously referred to *Panicum* L., *Milium* L., *Syntherisma* Walt., *Valota* Adans., and *Trichachne* Nees.

The relationships among *Digitaria sanguinalis*, *D. ciliaris*, and *D. bicornis*, are not clearly understood. The series of populations involved, commonly thought of as the "*D. sanguinalis* complex" are known to include tetraploids ($2n = 36$), hexaploids ($2n = 54$), and octoploids ($2n = 72$), with the characteristically tetraploid *D. sanguinalis* occupying the cooler habitats and the octoploid *D. bicornis* most frequent in many tropical areas. Chase and Niles (Index Grass species 1: 588, 589. 1962) list a total of 51 varieties and formae under *D. sanguinalis*.

KEY TO THE SPECIES

1. Rachis of panicle branches winged, the wings often as broad as the body; annuals or weak perennials, usually with decumbent and trailing culms. . . 2
- 1a. Rachis of panicle branches not winged or obscurely so; spikelets 4-5 mm. long; perennials with erect or decumbent culms. 8
2. Spikelets 2.7-3.5 mm. long; lemma of upper floret light brown or grayish; nerves of lemma of lower floret equidistant or the lateral ones crowded to the margins. 3
- 2a. Spikelets 1.5-2.5 mm. long; lemma of upper floret dark brown at maturity; nerves of lemma of lower floret of both sessile and pediceled spikelets strong and equally spaced. 5
3. Lemma of lower floret glabrous or inconspicuously pubescent on margins, the nerves not equidistant, the lateral ones crowded to the margins. 4
- 3a. Lemma of lower floret of at least some pediceled spikelets densely silky-villous on margins, the hairs spreading-erect at maturity; lemma of lower floret of sessile spikelet often with 5 equidistant nerves, the lateral ones not crowded to the margins. 3. *D. bicornis*
4. Second glume 1.0-1.7 mm. long; spikelets 2.2-2.3(-3.0) mm. long; lemma of lower floret scabrous-hispid on lateral nerves. 1. *D. sanguinalis*
- 4a. Second glume 1.6-2.7 mm. long; spikelets (2.5-)2.8-3.5 mm. long; lemma of lower floret not scabrous-hispid on the lateral nerves. 2. *D. ciliaris*
5. Spikelets 2.0-2.5 mm. long. 6
- 5a. Spikelets 1.3-1.7 mm. long. 7
6. Rachis of panicle branch usually but not always with a few long spreading hairs; blades finely pubescent to villous. 4. *D. horizontalis*
- 6a. Rachis of panicle branch without scattered long hairs; blades glabrous or essentially so. 5. *D. ischaemum*
7. Plants annual, tufted, without creeping stoloniferous culms; wings of rachis typically 0.8-1.0 mm. broad but occasionally narrower. 6. *D. violascens*

- 7a. Plants weakly perennial, with decumbent, widely creeping culms; wings of rachis 0.5-0.8 mm. broad. 7. *D. longiflora*
- 8. Lemma of lower floret glabrous on back but densely villous on margins. 8. *D. similis*
- 8a. Lemma of lower floret hairy (usually villous) on nerves of back. 9
- 9. Lower panicle branches fascicled on one side of main axis. 9. *D. insularis*
- 9a. Lower panicle branches in a whorl. 10. *D. laxa*

1. *Digitaria sanguinalis* (L.) Scop., Fl. Carn. ed. 2. 1: 52. 1772.

Basionym: *Panicum sanguinalis* L., Sp. Pl. 57. 1753.

Type: "America, So. Europe."

Annual with weak, spreading culms mostly 30-100 mm. long, these often decumbent at base and rooting at the lower nodes, the erect culm or branch tips seldom more than about 60 cm. tall. Sheaths typically pubescent with papilla-based hairs. Ligules membranous, glabrous, irregularly dissected, mostly 1.0-2.5 mm. long. Blades soft, flat, 5-10 mm. broad, pubescent on one or both surfaces to nearly glabrous. Inflorescence usually with 4-9 erect or spreading, unbranched, racemose branches, these digitate at the culm apex or at the apex and in 1-2 irregular verticils below. Spikelets in pairs of one sessile and one pediceled, usually 2.7-3.0 mm. long but occasionally longer. First glume a minute, triangular scale or absent. Lower lemma of both sessile and pediceled spikelets with 5 unequally spaced nerves, the lateral crowded to the margins, the midnerve with a wide space on either side. Spikelets green or purple-tinged.

GENERAL DISTRIBUTION: Worldwide in the cooler latitudes, less frequent in warm regions where *D. ciliaris* and *D. bicornis* are more commonly found.

DISTRIBUTION IN LESSER ANTILLES: Reported only from Guadeloupe.

HABITAT: Frequent in disturbed soils of gardens and ditches; usually growing as a weed of moist, disturbed sites.

2. *Digitaria ciliaris* (Retz.) Koel., Desc. Gram. 27. 1802.

Basionym: *Panicum ciliare* Retz., Obs. Bot. 4: 16. 1786.

Type: *Wennerberg s. n.*, China.

Syn.: *Panicum adscendens* H.B.K., Nov. Gen. Sp. 1: 97. 1815. (Type: *Humboldt s.n.*, Guayaquil, Mexico.)

Digitaria adscendens (H.B.K.) Henr. in Blumea 1: 92. 1934.

Annual with weak, decumbent-spreading culms, these much-branched and stoloniferous below, with erect flowering shoots to 60 cm. tall. Leaves sparsely pubescent with long, papilla-based hairs, especially on the sheaths, to nearly glabrous. Panicles with 2-12 or more unbranched primary branches mostly 5-15 cm. long, the branches usually in irregular verticils. Spikelets (2.5-)2.8-3.5 mm. long, in pairs of one subsessile and one pedi-

celed. First glume a minute, triangular scale, the second glume 1.6–2.7 mm. long, usually ciliate-pubescent. Lemma of lower floret lacking spicules on lateral nerves. Lower lemmas of both sessile and pediceled spikelets inconspicuously or conspicuously pilose with long hairs, strongly 5-nerved, the nerves unequally spaced, the lateral ones crowded to the margins.

GENERAL DISTRIBUTION: Southern United States, the Antilles, and Mexico to Central and South America, presumably introduced from the Old World.

DISTRIBUTION IN LESSER ANTILLES: St. Kitts, Redonda, Guadeloupe, Dominica, Barbados. Most Caribbean plants previously identified as *D. sanguinalis* are referable to *D. ciliaris* and *D. bicornis*.

HABITAT: A weed of disturbed sites, often in sand.

3. *Digitaria bicornis* (Lam.) Roem. & Schult., Syst. Veg. 2: 470. 1817.

Basionym: *Paspalum bicornis* Lam., Tabl. Encycl. Méth. Bot. 1: 176. 1791.

Type: India, "Sonnerat."

Syn.: *Digitaria biformis* Willd., Enum. Hort. Berol. 1: 92. 1809. (Type: "*Habitat in insula Mauriti et Borboniae. Bory de St. Vincent.*")

Digitaria diversiflora Swallen in Rhodora 65: 356. 1963. (Type: Hitchcock 9636, Jamaica, Black River.)

Annual with general habit of *D. ciliaris*. Spikelets heteromorphic, the lower lemma of the sessile one glabrous to slightly pubescent, with equally or unequally spaced nerves, the pediceled spikelets with the lower lemma often with spreading, villous-ciliate hairs on the margins and typically unequally spaced nerves, the laterals widely separated from the midnerve.

GENERAL DISTRIBUTION: Worldwide in the tropics and subtropics.

DISTRIBUTION IN LESSER ANTILLES: Anguilla, Nevis, Montserrat, Dominica, Martinique, St. Lucia.

HABITAT: A common weed of disturbed sites, often in sand. This is perhaps the most common *Digitaria* of the Lesser Antilles.

4. *Digitaria horizontalis* Willd., Enum. Hort. Berol. 1: 92. 1809.

Type: Dominican Republic, Santo Domingo.

Syn.: *Digitaria setigera* Roth in Roem. & Schult., Syst. Veg. 2: 474. 1817. (Type: India.)

Digitaria setosa Desv. in Hamilt., Prodr. 6. 1825. (Type: Antilles.)

Panicum hamiltonii Kunth, Rev. Gram. 1: Sup. IX. 1830. (Type: Antilles.)

Annual with decumbent, spreading, branching, stoloniferous culm bases and erect floriferous shoots mostly 30–50 cm. tall. Sheaths hispid or pilose with long, spreading hairs. Ligules 1.0–1.5 mm. long. Blades thin, flat, mostly 5–15 mm. broad, finely pilose on one or both surfaces. Panicles with 5–15 slender, unbranched primary branches, at least the lower ones in verticils of 3–6. Branch rachis usually with a few scattered, papilla-based hairs as much as 5–6 mm. long. Spikelets 2.0–2.5 mm. long. First glume

usually absent, the second glume about half as long as spikelet, pilose on margins and tip. Lemma of lower floret with 5 equidistant nerves, with a few soft hairs on the margins.

GENERAL DISTRIBUTION: Widespread in tropical regions of both hemispheres.

DISTRIBUTION IN LESSER ANTILLES: Antigua(?), Saba, St. Kitts, Montserrat, Redonda, Guadeloupe, Dominica, Martinique, St. Vincent, the Grenadines, Grenada.

HABITAT: A weed of disturbed, often sandy sites.

The Dominican specimen *Kimber 1061* possibly represents a distinct taxon. The blades of this collection are glabrous except for a few long hairs near the base. Also, on a few of the pediceled spikelets the lower lemma has long, spreading, ciliate-pubescent margins. The same combination of characters has been observed on *Palmer 145* from Tampico, Tamaulipas, Mexico.

5. *Digitaria ischaemum* (Schreb.) Schreb. ex Muhl., Cat. Pl. 9. 1813.

Basionym: *Panicum ischaemum* Schreb. ex Schweigger & Koerte, Spec. Fl. Erlang. 16. 1804.

Type: Europe.

Tufted annual, usually with decumbent, creeping culms, and erect shoots mostly 20-50 cm. tall. Leaves glabrous or with a few long hairs at the sheath-blade junction. Ligules about 2 mm. long. Blades mostly 4-7 mm. broad. Panicle branches 3-9 cm. long, mostly 2-6 per culm, commonly all digitate at apex or with 1 or 2 branches below the apical cluster. Spikelets mostly 1.9-2.2 mm. long. First glume absent or vestigial. Second glume more than $\frac{1}{4}$ as long as lemma of upper floret, puberulent. Lemma of lower floret 5- to 7-nerved, puberulent, the hairs often minutely capitate.

GENERAL DISTRIBUTION: Widely distributed in tropical and temperate regions of the world, generally considered to be introduced in North America.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe.

HABITAT: A weed of disturbed, often sandy sites.

6. *Digitaria violascens* Link, Hort. Berol. 1: 229. 1827.

Type: Brazil.

Tufted annual, with erect or decumbent-spreading culms, similar in general habit to *D. ischaemum* and also with essentially glabrous leaves. Panicle branches mostly 2-5, occasionally up to 7, 5-10 cm. long. Branch rachis often 1 mm. broad but occasionally only 0.7-0.8 mm. broad. Spikelets 1.3-1.7 mm. long, puberulent with noncapitellate hairs.

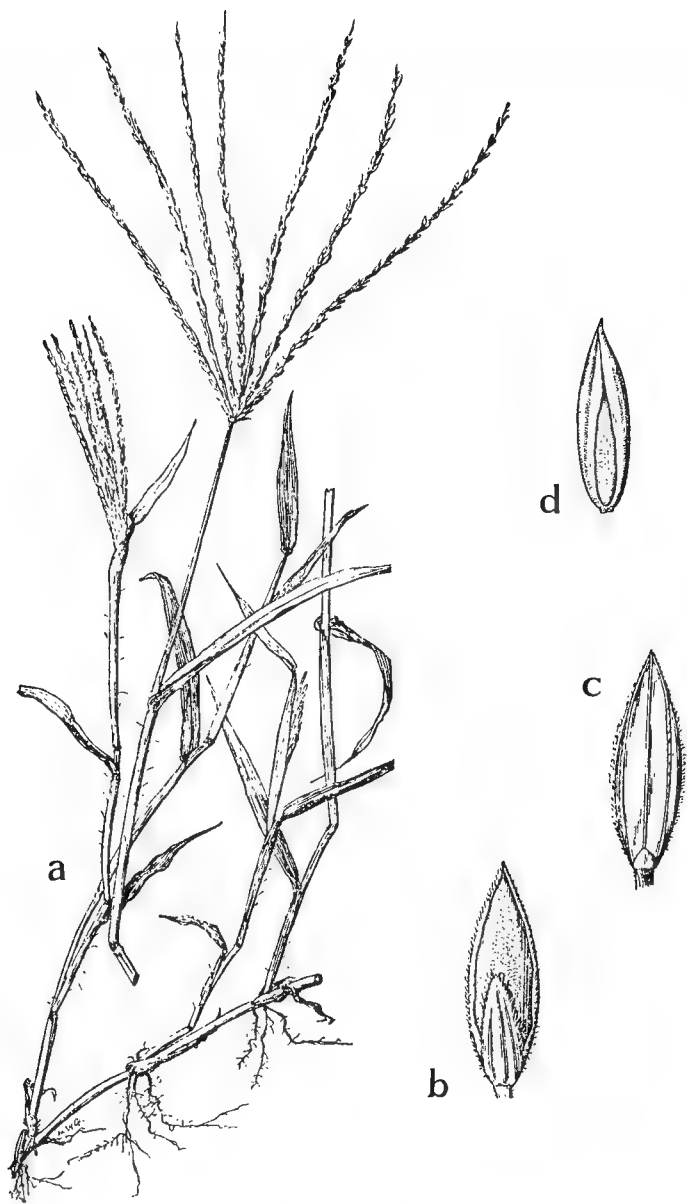


FIGURE 30. Poaceae. a-d, *Digitaria sanguinalis*: a, culm bases and inflorescence, $\times 0.5$; b, c, two views of spikelet, $\times 10$; d, floret, $\times 10$. (Reprinted from Hitchcock, Manual of the grasses of the United States, p. 577, fig. 827. 1951.)

GENERAL DISTRIBUTION: Widespread in tropical and subtropical regions of the world, reportedly introduced into North America.

DISTRIBUTION IN LESSER ANTILLES: Dominica.

HABITAT: A weed of disturbed sites, often in sand.

7. *Digitaria longiflora* (Retz.) Pers., Syn. Pl. 1: 85. 1805.

Basionym: *Paspalum longiflorum* Retz., Obs. Bot. 4: 15. 1786.

Type: India.

Weak perennial or annual with widely creeping stolons and glabrous leaves. Ligules 1.0–1.5 mm. long. Blades lanceolate, 2–5 cm. broad, those of the stolons mostly 1–3 cm. long, the erect shoots with blades to 20 cm. long. Panicles subdigitate, with 2–4 branches, these 3–10 cm. long. Branch rachis 0.5–0.8 mm. broad. Spikelets glabrous or minutely pubescent, 1.4–1.6 mm. long.

GENERAL DISTRIBUTION: Reportedly introduced in North America and the Antilles from the Old World.

DISTRIBUTION IN LESSER ANTILLES: Antigua, Nevis, St. Lucia.

HABITAT: On sandy, disturbed habitats, often along the ocean.

8. *Digitaria similis* Beetle ex Gould in Jour. Arnold Arb. 60: 320. 1979.

Based on *Trichachne affinis* Swallen in *Rhodora* 65: 355, 356. 1963, non *Digitaria affinis* Opiz, 1836, nec *Digitaria affinis* Roem. & Schult., 1817.

Type: Dominican Republic. Prov. of Santiago. Quinqua. *Ekman* in 1930 (holotype, US).

Perennial bunchgrass with a knotty, rhizomatous base and erect culms mostly 50–100 cm. tall but depauperate plants 20 cm. or less tall. Sheaths sparsely hispid. Ligule membranous, whitish, 1.5–2.0 mm. long. Blades thin, glabrous, mostly 5–9 mm. broad. Inflorescence a contracted panicle 10–18 cm. long, with few to numerous branches, the branches 6–10 cm. long. Spikelets in unequally pediceled pairs, mostly 3.5–4.5 mm. long. First glume short, rounded, lobed or occasionally elongate. Second glume 5-nerved, densely long-villous on back and margins. Lemma of lower floret ovate, acuminate, with 5 strong nerves, glabrous on nerves and internerves but densely villous on margins.

GENERAL DISTRIBUTION: Puerto Rico to Mexico and south to southern Brazil.

DISTRIBUTION IN LESSER ANTILLES: Known only from one collection, *Howard* 15234 (US), made on Redonda.

HABITAT: On dry, open slopes, the Redonda collection at 1000 m.

Swallen (in *Rhodora* 65: 356. 1963) noted that the Redonda collection is of depauperate plants. The culms are only 10-25 cm. tall and the blades are mostly 2-3 mm. broad.

9. *Digitaria insularis* (L.) Mez ex Ekman in Arkiv för Bot. 11(4): 17. 1912.

Basionym: *Andropogon insularis* L., Syst. Nat. ed. 10. 2: 1304. 1759.

Type: Jamaica.

Syn.: *Trichachne insularis* (L.) Nees, Agrost. Bras. 86. 1826.

Saccharum polystachyum Sieb. in Kunth, Enum. Pl. 1: 124. 1833. (Type: Martinique.)

Panicum duchaissingii Steud., Syn. Pl. Glum. 1: 93. 1854. (Type: Guadeloupe.)

Coarse perennial with culms mostly 60-150 cm. tall, stiffly erect from a hard, knotty base. Lowermost leaf sheaths usually densely pubescent, the herbage otherwise glabrous or scabrous. Ligules 2-3 mm. long. Blades flat, up to 25 cm. long and mostly 0.5-1.0 cm. broad. Panicle contracted, rather densely flowered, 12-30 cm. long, the lower branches appressed along the axis. Spikelets 3.6-4.2 mm. long excluding the hairs. First glume minute, second glume and lemma of lower floret shaggy-hirsute with long, brownish hairs, the hairs often exceeding the spikelets in length. Lemma of upper floret dark brown, lanceolate-acuminate, as long as the spikelet.

GENERAL DISTRIBUTION: Widely distributed in the tropics and subtropics of the Americas.

DISTRIBUTION IN LESSER ANTILLES: St. Martin, Antigua, Saba, St. Eustatius, St. Kitts, Nevis, Montserrat, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Grenada.

HABITAT: Low, moist ground, often in disturbed, weedy areas.

10. *Digitaria laxa* (Reichenb.) Parodi in Physis 9: 18, 31. 1928.

Basionym: *Reimaria laxa* Reichenb. in Spreng., Tent. Suppl. Syst. Veg. 2. 1828.

Type: Surinam.

Syn.: *Trichachne laxa* (Reichenb.) Hitchc., in U. S. D. A. Misc. Publ. 243: 165. 1936.

Coarse perennial with culms 1-2 m. tall, in large clumps. Sheaths tuberculate-hispid. Blades long, flat, 5-15 mm. broad, glabrous or sparsely hispid. Panicle up to 25 cm. long, with numerous, closely aggregated branches 15-20 cm. long, spreading in age. Spikelets narrowly lanceolate, acuminate, 4-5 mm. long, sparsely pilose with long, soft hairs.

GENERAL DISTRIBUTION: Trinidad and Tobago south to Paraguay.

DISTRIBUTION IN LESSER ANTILLES: Grenada, *Broadway 1782* (US).

HABITAT: Moist, open ground.

34. PANICUM Linnaeus

Panicum L., Sp. Pl. 55. 1753.

FIGURE 31.

Annuals and perennials of diverse habit. Ligule a membrane, a fringe of hairs or absent. Inflorescence an open or contracted panicle, in some species the primary panicle branches simple and spicate. Spikelets 2-flowered, the lower floret neuter or staminate, the upper floret perfect. Disarticulation usually below glumes, infrequently at base of upper floret (grain). Glumes both present and usually short. Lower floret with a lemma similar to the glumes in texture and usually equalling or slightly longer than the second glume. Lemma of upper floret indurate or chartaceous, mostly smooth and shiny, rarely rugose or hairy on back, tightly clasping the palea with thick, usually inrolled margins. Palea of upper floret like the lemma in texture, with 2 strong, widely separated nerves.

TYPE SPECIES: *Panicum miliaceum* L.

Panicum is perhaps the largest of the grass genera, with about 450 species distributed throughout the warmer parts of the world.

KEY TO THE SPECIES

1. Panicles with spikelets in unequally pediceled pairs crowded along short, simple (unbranched) unilateral primary branches. 2
- 1a. Panicles with spikelets single, paired or in fascicles on secondary as well as primary branches. 5
2. Lemma of lower floret with a pair of crateriform glands; spikelets hispid. 1. *P. pulchellum*
- 2a. Lemma of lower floret without glands; spikelets glabrous or rarely sparsely hispid. 3
3. Spikelets 2-3 mm. long; blades 1-11 cm. long. 4
- 3a. Spikelets 1.0-1.5 mm. long; blades, at least some, commonly more than 11 cm. long. 4. *P. pilosum*
4. Blades typically 1-5 cm. long; panicle branches 0.5-1.0 cm. long; spikelets 2.0-2.5 mm. long. 2. *P. stoloniferum*
- 4a. Blades (at least some) 6-11 cm. long; panicle branches mostly 1.0-2.5 cm. long; spikelets 2.7-3.0 mm. long. 3. *P. frondescens*
5. Lemma and palea of upper floret transversely rugose; culms coarse, mostly 1.5-2.5 mm. tall. 5. *P. maximum*
- 5a. Lemma and palea of upper floret not transversely rugose; culms tall or short. 6
6. First glume of at least some spikelets 1/4-1/5 or less as long as the spikelet. 7
- 6a. First glume 1/3 or more as long as spikelet. 9
7. Spikelets 3.0-3.6 mm. long; lemma of upper floret glabrous. 6. *P. aquaticum*
- 7a. Spikelets 1.5-2.0 mm. long. 8
8. Lemma of upper floret glabrous. 7. *P. trichanthum*
- 8a. Lemma of upper floret sparsely pubescent. 8. *P. schiffneri*
9. Plants annual; panicles open, diffuse, the spikelets spreading on long pedicels. 10

- 9a. Plants perennial; panicles open or contracted, the spikelets usually appressed on short pedicels. 11
- 10. Leaf blades mostly 2-7 cm. long and 6-22 mm. broad; spikelets 1.0-1.6 mm. long. 9. *P. trichoides*
- 10a. Leaf blades mostly more than 7 cm. long; spikelets 2.0-3.5 mm. long. 10. *P. capillare*
- 11. Culms and sheaths laterally compressed and keeled, at least below; pedicels (at least some) usually with 1 to few long, stiff, usually papilla-based hairs; spikelets 1.6-2.5 mm. long. 11. *P. rigidulum*
- 11a. Culms and sheaths not laterally compressed and keeled; pedicels without long hairs. 12
- 12. Spikelets 2.3-3.4 mm. long. 13
- 12a. Spikelets 1.2-2.2 mm. long. 14
- 13. Spikelets 2.8-3.4 mm. long; culms erect; blades mostly 20-40 cm. long and 8-15 mm. broad. 13. *P. ghiesbreghtii*
- 13a. Spikelets 2.3-2.8 mm. long; culms spreading or prostrate; blades mostly 5-20 cm. long and 1.0-4.5 mm. broad. 14. *P. diffusum*
- 14. Spikelets 1.7-2.2 mm. long; blades mostly 15-40 mm. broad. 12. *P. hirsutum*
- 14a. Spikelets 1.2-1.5 mm. long; blades mostly 6-15 (rarely to 20) mm. broad. 15. *P. laxum*

1. ***Panicum pulchellum*** Raddi, Agrost. Bras. 42. 1823.

Type: Brazil.

Slender perennial (or annual) with culms decumbent or creeping below, and erect, little-branched flowering shoots mostly 15-75 cm. long. Culms more or less pilose, the nodes bearded. Sheaths narrow, shorter than the internodes, ciliate on the margins and pilose on the collar. Blades ovate-lanceolate, thin, slightly falcate, mostly 1.5-5.0 cm. long and 8-18 mm. broad, glabrous or sparsely hairy. Panicles mostly 3-14 cm. long, with spikelets subsessile on widely spaced, spreading or reflexed spicate branches 5-15 mm. long. Spikelets mostly 1.6-2.0 mm. long, puberulent, the first glume short, the second glume and lemma of lower floret narrowly acute or acuminate, the lemma typically with two elevated glands about $\frac{1}{3}$ of the way down from the tip. Lemma of upper floret smooth, brownish, about 1.3 mm. long.

GENERAL DISTRIBUTION: Antilles, southern Mexico and Central America to Brazil.

DISTRIBUTION IN LESSER ANTILLES: Martinique (*Duss* 767; *Belanger s.n.*, in 1854).

On the specimen of *Duss* 767 at New York Botanical Garden, the papery, glandular-hispid lemmas of the lower florets for the most part lack the elevated glands typical of the species.

2. *Panicum stoloniferum* Poir. in Lam., Encycl. Méth. Bot. Suppl. 4: 274. 1816.

Type: Cayenne.

Slender, creeping branching many-noded perennial (or annual?), mat-forming and rooting at the nodes. Culms puberulent in lines, the nodes bearded. Sheaths shorter than internodes, hairy. Blades flat, lanceolate, 1-5 cm. long, 3-15 mm. broad, puberulent on both surfaces or the adaxial surface glabrous, abruptly constricted at base. Panicles 1-4(-5) cm. long, the spikelets sessile and crowded on short branches. Spikelets 2.0-2.5 mm. long, the lemma of lower floret slightly longer than the second glume and much longer than the shiny, narrow, yellowish-brown lemma of upper floret.

GENERAL DISTRIBUTION: Central America south to Brazil.

DISTRIBUTION IN LESSER ANTILLES: Martinique, *Duss 1291* (us).

HABITAT: Moist, shady sites.

3. *Panicum frondescens* Meyer, Prim. Fl. Esseq. 56. 1818.

Basionym: *Hymenachne frondescens* Fourn., Mex. Pl. 2: 36. 1886.

Type: British Guiana.

Perennial with slender culms from a decumbent base, the lower culm sections often prostrate and rooting at the nodes. Flowering culms with slender, elongate peduncles, mostly 30-50 cm. tall. Culm nodes and margins of the short sheaths and sheath collar puberulent. Blades lanceolate, 5-11 cm. long, 8-20 mm. broad, glabrous or sparsely short-hispid on the adaxial surface, the hairs often minutely papilla-based. Base of blade abruptly narrowed into a short, petiolelike base. Panicles 5-15 cm. long, with rather distant or closely placed, simple, erect or widely spreading branches mostly 1.0-2.5 cm. long. Main panicle axis pubescent with short, often matted hairs, the panicle branches glabrous. Spikelets mostly in unequally pediceled pairs, 2.7-3.0 mm. long, with a short, obtuse first glume, and an acute or acuminate second glume and lower lemma, the glume slightly shorter. Second glume and lemma occasionally with a few hairs. Lemma of upper floret shiny, brownish, pointed, mostly 0.5-1.0 mm. shorter than the lemma of lower floret.

GENERAL DISTRIBUTION: Central America to Brazil.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe, St. Vincent.

HABITAT: Moist banks, swales and marshy places at low elevations.

4. *Panicum pilosum* Sw., Prodr. 22. 1788.

Type: Jamaica.

Syn: *Panicum distichum* Lam., Encycl. Méth. Bot. 4: 731. 1798. (Type: Jamaica.)

Tufted or stoloniferous perennial (or annual?) with erect flowering culms 25–50 cm. tall from decumbent bases or widely spreading leafy stolons with roots and leafy shoots at the nodes. Culm nodes villous to nearly glabrous. Sheaths sparsely to densely ciliate on margins, usually glabrous on collar. Blades lanceolate, mostly 5–20 cm. long and 7–15 mm. broad, glabrous or sparsely hispid, broadest near the broad, often cordate base. Panicles 5–15 cm. long with several to numerous, slender, simple primary branches mostly 1.5–4.0 cm. long, these widely spreading at maturity. Branch rachis narrow, angular, with a few long, stiff hairs on the angles, the spikelets mostly in unequally pediceled pairs inserted in 2 rows. Spikelets 1.0–1.5 mm. long, glabrous, the first glume short and broad, the second glume slightly shorter than lemma of lower floret. Lemma of upper floret shiny, cream-colored, about as long as spikelet.

GENERAL DISTRIBUTION: Antilles and Mexico to Paraguay.

DISTRIBUTION IN LESSER ANTILLES: St. Kitts, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Grenada, Barbados.

HABITAT: Moist lowlands, ditches and swales.

5. *Panicum maximum* Jacq., Coll. Bot. 1: 76. 1786.

Type: Guadeloupe.

Syn: *Panicum trichocondylum* Steud., Syn. Pl. Glum. 2: 74. 1854. (Type: Guadeloupe.)

Stout perennial with thick culms 1.0–2.5 m. tall in clumps from a firm, often rhizomatous base. Culm nodes usually densely hirsute. Sheaths glabrous or hirsute, often with papilla-based hairs. Ligule a ring of hairs 1.5–4.0 mm. long. Blades flat, linear, elongate, mostly 0.8–3.5 cm. broad, variously hispid or pubescent to nearly glabrous, often with few to many stiff, long hairs just above ligule. Panicle 20–50 cm. long, open, broad or rather narrow, with slender, wiry branched and rebranched branches, the lower ones 8–20 cm. or more long. Spikelets narrowly oblong, glabrous, mostly 3.0–3.5 mm. long, short pediceled and rather widely spaced on the branches. First glume $\frac{1}{4}$ – $\frac{1}{3}$ as long as spikelet, usually rounded or obtuse at apex. Second glume and lemma of lower floret about equal, 0.7–1.0 mm. longer than lemma of upper floret. Lower floret staminate, with a palea as long as lemma. Lemma and palea of upper floret transverse-rugose, the lemma often slightly apiculate.

GENERAL DISTRIBUTION: Widespread through the tropics of the world, probably native to Africa.

DISTRIBUTION IN LESSER ANTILLES: Anguilla, St. Martin, Antigua, Saba, St. Eustatius, St. Kitts, Montserrat, Redonda, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, the Grenadines, Grenada, Barbados.

HABITAT: Moist, open ground at low elevations.

An important tropical forage grass. Used for pasture, though not especially palatable, and also cut and fed green.

6. *Panicum aquaticum* Poir. in Lam., *Encycl. Méth. Bot. Suppl.* 4: 281. 1816.

Type: Puerto Rico.

Perennial with flowering culms 30–100 cm. tall from decumbent or creeping succulent, stoloniferous bases, these rooting at the nodes. Sheaths glabrous. Ligule a minute, fringed membrane. Blades flat or folded, mostly 6–20 cm. long and 5–10 mm. broad, glabrous or pilose on adaxial surface at least near base. Panicle 10–20 cm. long, the spikelets rather distant on relatively few, long branches. Spikelets glabrous, narrowly ovate or oblong, 3.2–3.6 mm. long, with a broad, rounded first glume mostly $\frac{1}{4}$ or less the length of spikelet. Second glume and lemma about equal, acute to acuminate, exceeding the narrow lemma of upper floret by 0.5–1.0 mm. in length.

GENERAL DISTRIBUTION: Antilles and southern Mexico south to Paraguay.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe, *Duss* 3178 (NY, US), *Duss* 3180 (MO).

HABITAT: In wet soil along streams, lakes and marshes.

7. *Panicum trichanthum* Nees, *Agrost. Bras.* 210. 1829.

Type: *Siber*, Brazil.

Large, coarse, leafy perennial with branching, straggling culms 1.5–2.0 m. long, and large open panicles of minute spikelets. Culm nodes glabrous. Sheaths ciliate on margins, with or without hairs on the collar. Ligule membranous, short, often closely associated with long, coarse hairs at base of blade. Blades broadest in middle, tapering to both ends, mostly 8–15 cm. long and 10–15(–20) mm. or more broad, glabrous or hispid. Panicles broad and open, 10–30 cm. long, with numerous, much-branched branches and slender flexuous pedicels often much longer than spikelets. Spikelets broadly obovate or oblong, glabrous, 1.0–1.6 mm. long. First glume minute or absent, second glume and lemma of lower floret about equal or the glume slightly longer, both 3-nerved, minutely alveolate or roughened. Lemma of upper floret about as long as spikelet.

GENERAL DISTRIBUTION: Southern Mexico and the Antilles south to Paraguay.

DISTRIBUTION IN LESSER ANTILLES: St. Vincent, *Cooley* 8410 (GH).

HABITAT: Rocky, moist slopes, riverbanks and thickets.

8. *Panicum schiffneri* Hack., *Ergeb. Bot. Exped. Akad. Wiss. Sudbras.* 11. 1906.

Type: Brazil.

Perennial with weak, erect or sprawling culms 1.5-3.0 m. long, broad blades, and small to large, open or contracted panicles mostly 10-20 cm. long. Culms often branching and rooting at lower nodes. Sheath ciliate on margins and usually hispid with papilla-based hairs on back near apex and on collar. Blades mostly 10-18 cm. long and 12-25 mm. broad, scabrous and occasionally slightly hairy, acuminate at apex, abruptly narrowing at base. Panicle open, with a few long, spreading, few-flowered branches or short and compact with only short branches. Spikelets ovate or elliptic, 1.5-2.0 mm. long. Glumes and lemma of lower floret glabrous, the glume a very short, rounded scale. Second glume and lemma of lower floret about equal, acute or slightly beaked. Lemma of upper floret minutely appressed-pilose.

GENERAL DISTRIBUTION: Southern Mexico and the Antilles to Brazil.

DISTRIBUTION IN LESSER ANTILLES: Martinique, *Hahn 616, 719* (GH, UC).

HABITAT: On moist, shady banks.

The *Hahn 616* specimen in the Gray Herbarium comprises two inflorescences with spreading, few-flowered, very short-pedicceled spikelets, with the longest branch spreading, nearly simple, 11 cm. long; the collection in the herbarium of the University of California (Berkeley), with two leafy culms and two inflorescences, is similar.

9. *Panicum trichoides* Sw., *Prodr.* 24. 1788.

Type: Jamaica.

Syn.: *Panicum capillaceum* Lam., *Tabl. Encycl. Méth. Bot.* 1: 173. 1791. (Type: Puerto Rico.)

Tufted annual with slender, often branching and geniculate-decumbent culms, short, broad blades, and open panicles of minute spikelets on long, slender pedicels. Culms of flowering shoots mostly 15-40 cm. tall, hispid or puberulent at least below. Sheaths pubescent or hispid, often with papilla-based hairs. Ligule a short, ciliate membrane. Blades ovate-lanceolate, glabrous or sparsely hispid, mostly 2-7 mm. long and 6-22 mm. broad, often falcate. Panicles 4-18 cm. long, often $\frac{2}{3}$ or more as broad as long, with much-branched branches and capillary branchlets. Spikelets mostly 1.0-1.4 mm. long, on pedicels as much as 1-2 cm. long. Glumes and lemma of lower floret usually sparsely strigose, the first glume slightly less than half as long as spikelet, the second glume and lemma obtuse or rounded, the glume usually slightly shorter than the lemma. Lemma of upper floret light brown and minutely rugose at maturity.

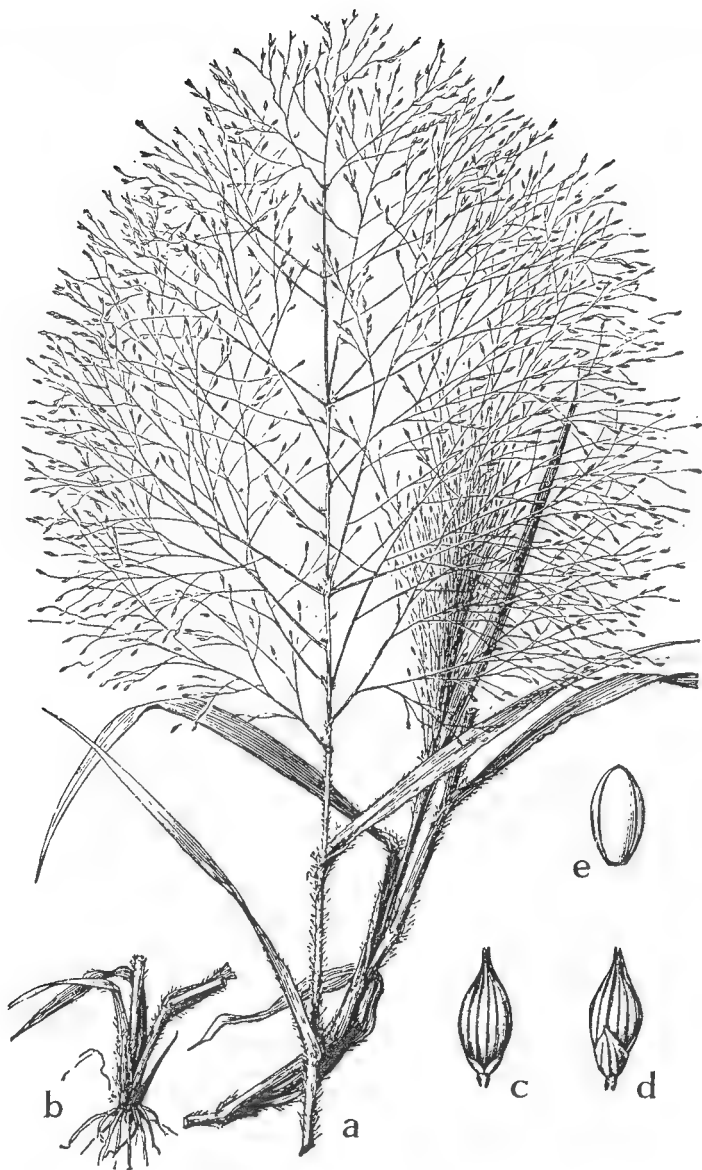


FIGURE 31. Poaceae. a-e, *Panicum capillare*: a, inflorescence, $\times 0.5$; b, culm base, $\times 0.5$; c, d, two views of spikelet, $\times 10$; e, floret, $\times 10$. (Reprinted from Hitchcock, Manual of the grasses of the West Indies, p. 256, fig. 208. 1936.)

GENERAL DISTRIBUTION: Southern Texas, Mexico, Central America and the Antilles south to Brazil and Peru; also in Asia and islands of the Pacific.

DISTRIBUTION IN LESSER ANTILLES: St. Martin, Antigua, Saba, St. Kitts, Montserrat, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Grenada, Barbados.

HABITAT: Moist, shady sites, often weedy in cultivated areas and plantations.

10. *Panicum capillare* L., Sp. Pl. 58. 1753.

Type: Virginia.

Annual with culms tufted, mostly 20-80 cm. tall but shorter on depauperate plants, usually branching at base and with culms decumbent-spreading. Culms hairy at least at the nodes. Sheaths hispid with papilla-based hairs. Ligule of short, stiff hairs, these more or less connate below, 0.7-1.5 (rarely to 2.0) mm. long. Blades thin, flat, elongate, mostly 5-15 mm. broad, usually hispid on one or both surfaces but occasionally ciliate just on margins. Panicle large, diffuse, often half as long as the entire culm, with spikelets widely spaced and only slightly if at all overlapping. Pedicels long, with at least some pedicels 1-3 cm. in length. Panicle often breaking off or disarticulating at base at maturity. Spikelets glabrous, 2.0-3.5 mm. long. First glume acute to acuminate, $\frac{1}{3}$ - $\frac{2}{3}$ as long as spikelet. Second glume and lemma of lower floret about equal, the tips usually rather abruptly extended into an acuminate apex. Lemma of upper floret smooth and shiny, 1.3-2.3 mm. long.

GENERAL DISTRIBUTION: Throughout the United States and in the Antilles.

DISTRIBUTION IN LESSER ANTILLES: Reported from St. Vincent but no Lesser Antillean specimens examined by the writer.

HABITAT: A common weed of open, disturbed soil, often on roadsides and in wasteplaces.

11. *Panicum rigidulum* Nees, Agrost. Bras. 163. 1829.

Type: Brazil.

Syn.: *Panicum agrostoides* Spreng., Pl. Pugill. 2: 4. 1815.

Panicum condensum Nash in Small, Fl. Southeast. U. S. 93. 1903. (Type: Florida.)

Perennial with flowering culms and sterile shoots densely clumped on a firm but not rhizomatous base. Culms strictly erect or decumbent below, 40-150 cm. tall, often branching at upper nodes to produce lateral panicles as well as the terminal one. Sheaths, at least the lower ones, laterally compressed and keeled, glabrous or occasionally hispid. Ligule a ciliate membrane 0.5-1.0 mm. long. Blades long and narrow, flat or folded, mostly

4-12 mm. broad and up to 50 cm. or more long, glabrous or sparsely hispid. Panicles variable, 10-40 cm. long, loosely contracted or with slender, spreading branches. Main panicle branches usually bare of spikelets near base, the spikelets clustered at the branch tips and on short branchlets. Branchlets and pedicels usually with a few long stiff hairs. Spikelets mostly 1.6-2.5 mm. long, narrowly pointed, the second glume and lemma of lower floret tapering gradually to a narrow point. First glume about half as long as spikelet. Lemma of upper floret smooth and shiny, narrowly ovate.

GENERAL DISTRIBUTION: Throughout the eastern half of the United States and southward through the Antilles and Central America to Brazil.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe, *Duss* 3919 (US).

HABITAT: In moist woodlands and marshy open pastures, often along stream courses and lakes.

12. *Panicum hirsutum* Sw., Fl. Ind. Occ. 1: 173. 1797.

Type: Jamaica.

Robust perennial with erect culms as much as 1 cm. thick and 1.0-1.5 m. or more tall. Culm nodes appressed-pubescent with hairs to 4 mm. long. Ligule membranous, about 0.5 mm. long. Sheaths rounded on back, papillose-hirsute with spreading to ascending prickly hairs, often densely hirsute on collar, often glabrate in age. Blades flat or folded, rather thick, glabrous or sparsely hispid, mostly 20-60 cm. long and 15-40 mm. broad. Panicles mostly 20-45 cm. long, short-exserted to included at base, open or somewhat contracted, much-branched and with numerous appressed, short-pedicel spikelets. Spikelets glabrous, acute at apex, mostly 1.7-2.2 mm. long. First glume acute, $\frac{1}{3}$ - $\frac{1}{2}$ the length of the spikelet. Second glume and lemma of lower floret about as long as spikelet. Lemma and palea of upper floret smooth and shiny.

GENERAL DISTRIBUTION: Southern Texas and the Antilles south to Brazil.

DISTRIBUTION IN LESSER ANTILLES: Antigua, Guadeloupe, Martinique, St. Lucia.

HABITAT: In low, moist, rich soils, often in shaded habitats.

It should be noted that the stiff, bristly sheath hairs of *P. hirsutum* may cause physical irritation to the skin when handled.

13. *Panicum ghiesbreghtii* Fourn., Mex. Pl. 2: 29. 1886.

Type: Mexico.

Syn.: *Panicum hirtivaginum* Hitchc. in Contr. U. S. Natl. Herb. 12: 223. 1909.
(Type: Wright 758, Cuba.)

Perennial with rather stout culms in small clumps, mostly 50-80 cm. tall, branched sparingly or not at all. Culm nodes densely hirsute with

both spreading and appressed hairs. Ligule a membrane about 0.5 mm. long, ciliate with hairs to 4.5 mm. long. Sheaths papillose-hirsute, the hairs dense for about 10 mm. above the node. Blades long and narrow, sparsely hirsute on one or both surfaces, mostly 20–40 cm. long and 8–15 mm. broad. Terminal panicle 20–35 cm. long, short-exserted, often nearly equalled by the upper blades, about $\frac{1}{2}$ as broad as long, the branches scabrous, ascending and naked at base, the spikelets usually appressed on short pedicels on the upper half of the branches. Lateral panicles often developed at the lower culm nodes, these partially included in sheath. Spikelets slender, glabrous, acuminate, 2.8–3.4 mm. long. First glume acute, about $\frac{1}{2}$ the length of the spikelet. Second glume and lemma of lower floret about equal, acuminate, about 0.5 mm. longer than the shiny, acute lemma of upper floret.

GENERAL DISTRIBUTION: Southern Texas to the Antilles and south to northern South America.

DISTRIBUTION IN LESSER ANTILLES: St. Martin, Antigua, Guadeloupe.

HABITAT: In low, moist ground, often in dense thickets.

14. *Panicum diffusum* Sw., Prodr. 23. 1788.

Type: Jamaica or Hispaniola.

Weak perennial with slender, usually spreading culms in small, dense tufts. Culms branching below, commonly 20–40 cm. long but occasionally much longer. Culm nodes pubescent with both spreading and erect hairs. Ligule a membrane 0.5–1.0 mm. long, fringed with hairs 1–2 mm. long. Blades flat and narrow, mostly 5–20 cm. long and 1.0–4.5 mm. broad. Sheaths mostly shorter than culm internodes, glabrous to hirsute. Terminal panicle exserted, pyramidal, 5–25 cm. long, with widely spaced, stiffly spreading branches bearing few, usually appressed spikelets on short branchlets and pedicels. Numerous short, few-flowered lateral panicles often developed at nodes only 1–5 cm. from base of plant. Spikelets glabrous, pointed at apex, 2.1–2.7 mm. long. First glume acute, $\frac{1}{2}$ the length of spikelet, the second glume and lemma of lower floret as long as spikelet. Lemma and palea of upper floret smooth and shiny, elliptical, acute, slightly shorter than the narrow, often acuminate tips of the second glume and lower lemma.

GENERAL DISTRIBUTION: Texas and Mexico to the Antilles and south to Brazil.

DISTRIBUTION IN LESSER ANTILLES: Anguilla, St. Martin, Antigua, St. Eustatius, Guadeloupe, Martinique.

HABITAT: Low, moist ground, often a weed of lawns and gardens, especially on clayey soils.

15. *Panicum laxum* Sw., Prodr. 23. 1788.

Type: Jamaica.

Syn.: *Panicum diandrum* Kunth, Rev. Gram. 2: 393, pl. 110. 1831. (Type: "Guadeloupe and Brazil.")

Panicum boliviense Hack. in Fedde Repert. Sp. Nov. 11: 19. 1912. (Type: Bolivia.)

Leafy perennial with slender or stout, decumbent or erect culms mostly 40–100(–150) cm. long, the culms sometimes rooting at the lower nodes. Culm nodes and leaves glabrous except for the short-ciliate leaf margins. Ligule a minute membranous rim. Blades dark green, long and flat or folded, mostly 6–15(rarely to 20) mm. broad, tapering to a slender point at apex, narrowing below to a rounded or moderately cordate base. Panicles mostly 8–35 cm. long, with strong, loosely spaced primary branches mostly 3–10 cm. long, these with spikelets clustered on short, appressed or erect-spreading secondary branchlets. Spikelets glabrous, 1.2–1.5 mm. long, with an acute or obtuse first glume $\frac{1}{2}$ – $\frac{2}{3}$ as long. Second glume and lemma of lower floret about equal, blunt at apex, about equalling the rather narrow, acute lemma of the upper floret.

GENERAL DISTRIBUTION: Southern Mexico and the Antilles south to Paraguay.

DISTRIBUTION IN LESSER ANTILLES: Antigua, Guadeloupe, Marie Galante, Dominica, Martinique, St. Lucia, St. Vincent, Grenada, Barbados.

HABITAT: Moist or wet banks and ditches, swales and low woodlands.

Hitchcock (Man. Grasses W. I. 269. 1936) reported *P. boliviense* from Guadeloupe, Dominica, Martinique and St. Lucia. On the basis of available evidence, this taxon seems to be based on vigorous, broad-bladed plants of *P. laxum*; however, the type of *P. boliviense* has not been examined by the writer.

35. CYRTOCOCCUM Stapf

Cyrtococcum Stapf in Prain, Fl. Trop. Afr. 9: 745. 1920.

Low annuals and perennials with decumbent or creeping culms and usually small, few-flowered panicles. Spikelets 2-flowered, the lower floret neuter, the upper floret perfect; spikelets laterally compressed and distinctly gibbous, long- or short-pediceled, obovate. Glumes 3-nerved, the first short, the second about as long as the 5-nerved lemma of lower floret. Palea of lower floret reduced or absent. Lemma of upper floret indurate, strongly gibbous on back, with a small crest near tip, the margins inrolled over the palea.

TYPE SPECIES: *Cyrtococcum setigerum* (Beauv.) Stapf, based on *Panicum setigerum* Beauv.

A genus of about seven species native to the tropics of the Old World; one species introduced in the Antilles.

1. *Cyrtococcum trigonum* (Retz.) A. Camus in Bull. Mus. Hist. Nat. Paris 27: 118. 1921.

Basionym: *Panicum trigonum* Retz., Obs. Bot. 3: 9. 1783.

Type: India.

Annual with slender, branching, decumbent or creeping culms, the culms usually widely spreading and often mat-forming, the erect floriferous branches mostly only 10-20(-30) cm. long. Sheaths ciliate on the margins, often hairy on the sheath node. Ligule a truncate or rounded membrane 0.3-0.5 mm. long. Blades flat, scabrous, sparsely short-hispid or pilose, mostly 1-3(-4) cm. long and 3-7 mm. broad. Panicles short, few-flowered, contracted or somewhat open, mostly 1.5-6.0 cm. long, the spikelets on short, usually appressed pedicels. First glume $\frac{1}{2}$ -1 $\frac{1}{2}$ as long as spikelet. Spikelets laterally flattened. Second glume and lemma of lower floret appressed-strigose, 3-nerved, the second glume broad and rounded on the back, the lemma longer and narrower. Lemma and palea of upper floret minutely alveolate, the lemma flattened laterally and "humped up" in the middle.

GENERAL DISTRIBUTION: Widespread in the Old World tropics; introduced in the Antilles.

DISTRIBUTION IN LESSER ANTILLES: Reported from Dominica, but no specimens have been seen by the author.

HABITAT: In shady, moist habitats.

36. *ECHINOCHLOA* Beauvois

Echinochloa Beauv., Ess. Agrost. 53, pl. 11, f. 2. 1812.

Coarse annuals and perennials, mostly with thickish, succulent culms and broad, thin blades. Ligule a ring of hairs or absent. Inflorescence a panicle with few to numerous, simple or rebranched, densely flowered branches. Spikelets subsessile in irregular fascicles or in regular rows on the angular branch rachis. Spikelets awned or awnless, 2-flowered, the lower floret staminate or neuter, the upper floret perfect. Glumes and lemma of lower floret variously scabrous or hairy, infrequently glabrous. First glume short, acute, the second glume and lemma of lower floret about equal, acute, acuminate, awnless or awned. Lemma of upper (perfect) floret indurate, smooth and shiny, with inrolled margins and usually an abruptly pointed apex.

TYPE SPECIES: *Echinochloa crusgalli* (L.) Beauv., based on *Panicum crusgalli* L.

Species about 30, in the warmer regions of the world, often growing as weeds.

KEY TO THE SPECIES

1. Ligule developed as a row of stiff hairs, present at least on the lower leaves; plants perennial. 2
- 1a. Ligule absent; plants annual. 3
2. Spikelets 3.5-6.5 mm. long; awn of lower lemma usually 5-10 mm. long. 1. *E. polystachya*
- 2a. Spikelets 2.5-3.0 mm. long; awn of lower lemma less than 2 mm. long. 2. *E. guadeloupensis*
3. Primary inflorescence branches simple, usually 2 cm. or less long; spikelets awnless, arranged in 4 regular rows on branch rachis; inflorescence branches and spikelets lacking stiff papilla-based hairs. 5. *E. colona*
- 3a. Primary inflorescence branches often rebranched, the lower branches commonly more than 2 cm. long; spikelets awnless or awned, in regular rows or not; inflorescence branches and spikelets with or without papilla-based hairs. 4
4. Lemma of upper (perfect) floret narrowly ovate or oblong; long, papilla-based hairs usually not developed on inflorescence branches, the hairs when present usually shorter than the spikelets; panicle long, densely flowered and often drooping, with numerous branches. 3. *E. crus-pavonis*
- 4a. Lemma of upper floret broadly ovate or oblong; stiff hairs as long as or longer than spikelets, sparsely developed on inflorescence branches; panicle long or short, stiffly erect, with few or numerous branches. 4. *E. crugalli*

1. *Echinochloa polystachya* (H.B.K.) Hitchc. in Contr. U. S. Natl. Herb. 22: 135. 1920.

Basionym: *Oplismenus polystachyus* H.B.K., Nov. Gen. Sp. 1: 107. 1815.

Type: Columbia.

Syn.: *Panicum spectabile* Nees ex Trin., Gram. Pan. 138. 1826.

Echinochloa spectabilis Link, Hort. Berol. 2: 209. 1833.

Coarse perennial with stout culms 1-2 m. tall, these frequently decumbent and rooting at the lower nodes. Culm nodes densely hairy to minutely puberulent. Sheaths glabrous or hairy. Ligule a row of yellowish hairs, present at least on lower leaves. Blades flat, to 30 mm. broad and as much as 40 cm. long. Panicles contracted, usually 15-30 cm. long. Main inflorescence axis and branches sharply angled, with stout papilla-based hairs on the ridges. Spikelets 3.5-6.5 mm. long to base of awn. Second glume acuminate or short awn-tipped. Lemma of lower floret with an awn 2-15 mm. long. Lower floret with large, well-developed stamens and palea. Lemma of upper floret narrowly ovate or elliptical, the coriaceous apex obtuse, with a well-differentiated, thin, membranous, withering tip.

GENERAL DISTRIBUTION: Southern United States and the Antilles south through Central and South America to Argentina.

DISTRIBUTION IN LESSER ANTILLES: Antigua, Martinique, St. Lucia.

HABITAT: Low, moist areas, often in swales and ditches.

2. *Echinochloa guadeloupensis* (Hack.) Wiegand in Rhodora 23: 63. 1921.

Basionym: *Panicum spectabile* Nees var. *guadeloupense* Hack. in Notizbl. Bot. Gart. Berlin 1: 328. 1897.

Type: Guadeloupe, *Duss* 3176.

Robust perennial with thick culms mostly 1.5-2.5 m. tall from a firm, often rhizomatous base. Sheaths usually glabrous. Ligule a row of stiff, yellowish hairs 1-2 mm. long. Blades relatively long and narrow, mostly 5-10 mm. broad, glabrous or scabrous. Panicle 20-40 cm. long, with erect-spreading, usually simple branches mostly 2-5 cm. long. Panicle branches angular, with a few long, stiff, papilla-based hairs on the angles. Spikelets mostly 2.5-3.0 mm. long. Glumes and lower lemma scaberulous on the nerves but otherwise glabrous. Lower lemma acute or minutely apiculate. Lemma of upper floret 2.2-2.5 mm. long.

GENERAL DISTRIBUTION: A native of tropical and subtropical regions of the New World known only from the Lesser Antilles and Chiapas, Mexico.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe and (?) St. Lucia.

HABITAT: Low, moist areas, often in ditches and swales.

In 1936, Hitchcock (Man. Grasses W. I. 325) referred Lesser Antilles plants of this taxon to *E. pyramidalis* (Lam.) Hitchc. & Chase, an African species. Wiegand, however, believed this to be a New World species, stating in his monographic treatment of *Echinochloa* (in Rhodora 23: 63, 64. 1921) that the type material differed from African plants of *E. pyramidalis* in having smaller spikelets (3.5 mm. long as opposed to 4.5 mm. long) and smaller anthers (1 mm. long as opposed to 1.5-2.0 mm. long). Support for the opinion of Wiegand is provided by two recent collections of this species from Chiapas, Mexico, one from the Municipality of Ocozocoautla de Espinosa (*Breedlove* 37817 (ds)) and the other from the Municipality of Palenque (*Breedlove* 26614 (ds)).

3. *Echinochloa crus-pavonis* (H.B.K.) Schult., Mant. 2: 269. 1824.

Basionym: *Oplismenus crus-pavonis* H.B.K., Nov. Gen. Sp. 1: 108. 1815.

Type: Venezuela.

Syn.: *Panicum sabulicola* Nees, Agrost. Bras. 258. 1829. (Type: Brazil.)

Coarse, leafy annual with culms mostly 80-150 cm. tall. Culms glabrous, usually with numerous, slightly swollen nodes. Leaves glabrous, the ligule absent. Blades elongate, flat, mostly 7-20 mm. broad. Panicles dense and contracted, 12-30 cm. long, erect or in age nodding, with lower branches 5-10 cm. long. Panicle branches scabrous and often variously hairy, rarely with long, papilla-based hairs. Spikelets mostly 2.5-3.0 mm. long excluding awns. First glume about $\frac{1}{2}$ as long as spikelet, broadly acute, the second glume as long as body of lower lemma, thin and acuminate at tip. Lower lemma with an awn mostly 1-10 mm. long. Upper glume and lemma of

lower floret scabrous and variously hairy with long spicules and short, stiff hairs on and between the nerves, the hairs only slightly if at all papillate at base.

GENERAL DISTRIBUTION: Southern United States and the Antilles, southward to Argentina.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe, Martinique.

HABITAT: Wet lowlands or moist ditches and ravines in hilly terrain.

4. *Echinochloa crusgalli* (L.) Beauv., Ess. Agrost. 53, 161. 1812.

Basionym: *Panicum crusgalli* L., Sp. Pl. 56. 1753.

Type: "Europe and Virginia."

Coarse leafy annual with decumbent or erect culms mostly 40-120 cm. tall. Culms glabrous, with slightly swollen nodes. Ligule absent. Blades mostly 0.5-2.5 cm. broad, up to 40 cm. long, scabrous or sparsely hirsute, the margins finely serrate. Panicles mostly 10-25 cm. long, with appressed or stiffly spreading branches. Spikelets broadly ovate or elliptic, mostly 2.8-4.0 mm. long, awnless or the lower lemma with a short or long awn. Second glume and lower lemma usually scabrous-hispid with stout, papilla-based hairs on the nerves and with shorter hairs between the nerves. Palea of lower floret well developed. Grain ovate or elliptic, 1.3-2.2 mm. long.

GENERAL DISTRIBUTION: Native to southeastern Asia but widely cultivated in the warmer parts of the world.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe, *Duss* 3176.

HABITAT: In moist, open soils, often in ditches and swales.

Echinochloa crusgalli apparently is represented in the Lesser Antilles only by *E. crusgalli* var. *frumentacea* (Roxb.) F. W. Wight, Cent. Dict. Suppl. 810. 1909 (*Echinochloa frumentacea* (Roxb.) Link, Hort. Berol. 1: 204. 1827). This variety is distinguished by having the panicle erect-appressed and densely flowered with plump, awnless, usually grayish spikelets.

The var. *frumentacea* has been grown for forage throughout the world as Japanese millet. In India, the seeds are used for human food.

5. *Echinochloa colona* (L.) Link, Hort. Berol. 2: 209. 1833.

Basionym: *Panicum colonum* L., Syst. Nat. ed. 10. 2: 870. 1759.

Type: Jamaica.

Tufted, usually much-branched annual, with erect or spreading culms 10-70 cm. tall. Leaves glabrous, without ligules, the blades thin and flat, mostly 3-6 mm. broad. In the "zonal form," the blades have purple bars, "v's" or blotches. Inflorescence 5-10(-15) cm. long, with few to several branches mostly 1-2 cm. long. Nodes of inflorescence axis and branches glabrous or with a few hairs, the hairs never papilla-based. Spikelets 2.5-

3.0 mm. long, awnless, inconspicuously pubescent with fine, short hairs. Palea of lower floret well developed. Lemma of upper floret elliptic, usually 2.6-2.9 mm. long.

GENERAL DISTRIBUTION: In the tropics and subtropics of the world, assumed to be adventive in North America but may possibly be native.

DISTRIBUTION IN LESSER ANTILLES: St. Martin, Antigua, Saba, Nevis, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, the Grenadines, Grenada, Barbados.

HABITAT: A weed of ditches, fields, roadbanks and other disturbed areas.

37. OPLISMENUS Beauvois

Oplismenus Beauv., Fl. Owar. 2: 14, tab. 68, fig. 1. 1809. FIGURE 32.

Annuals and perennials with slender, decumbent or creeping culms; thin, flat, broad blades, and inflorescences with sessile spikelets on short, spicate branches. Ligule a ciliate membrane. Spikelets 2-flowered, the lower floret staminate or neuter. Disarticulation below glumes. Body of glumes about equal, the first glume tapering into a long awn, the second glume short-awned. Lemma of lower floret longer than upper floret, mucronate or short-awned, enclosing a hyaline palea. Lemma of upper floret firm, smooth and shiny, acute at apex, with margins clasping the palea but not inrolled.

TYPE SPECIES: *Oplismenus hirtellus* (L.) Beauv., based on *Panicum hirtellum* L.

Species about ten, found in the tropics and subtropics of both hemispheres.

1. *Oplismenus hirtellus* (L.) Beauv., Ess. Agrost. 54, 168. 1812.

Basionym: *Panicum hirtellum* L., Syst. Nat. ed. 10. 2: 870. 1759.

Type: Jamaica.

Annual with decumbent-spreading, stoloniferous culms and erect floriferous branches mostly 15-25 cm. tall. Culm nodes and sheath margins hirsute. Blades ranging from completely or nearly glabrous to hispid or hirsute, broad, short to moderately long, widely spreading and often reflexed at maturity, 4-20 mm. broad. Inflorescence a panicle with usually 3-7 short, widely spaced, spicate branches, these less than 5 mm. long and with 3-5 spikelets to more than 2 cm. long and with many spikelets. Glumes minutely notched at apex, the first with an awn mostly 0.5-1.5 cm. long, the second with a shorter awn. Lemma of lower floret about as long as second glume, mucronate or short-awned. Lemma of upper floret smooth, firm, elliptic, the flat margins almost completely enclosing the palea.

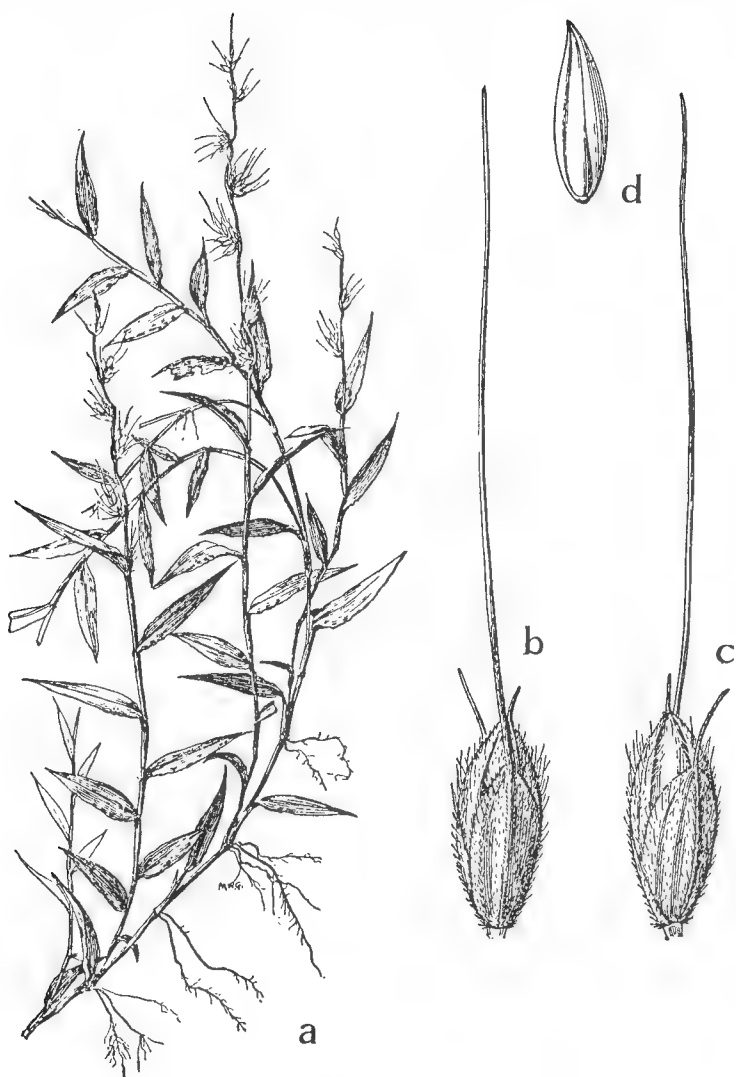


FIGURE 32. Poaceae. a-d, *Oplismenus hirtellus* var. *setarius*: a, habit, $\times 0.5$; b, c, two views of spikelet, $\times 10$; d, floret, $\times 10$. (Reprinted from Hitchcock, Manual of the grasses of the West Indies, p. 323, fig. 295. 1936.)

KEY TO THE SUBSPECIFIC TAXA

1. Rachis of panicle branch averaging more than 1 cm. long, bearing usually 9 or more spikelets; blades, at least some, more than 4 cm. long and more than 10 mm. broad. 1A. *O. hirtellus* var. *hirtellus*
- 1a. Rachis of panicle branch mostly 2-3 mm. long and usually with 3-5 spikelets; blades typically 1-3 cm. long and 4-10 mm. broad. 1B. *O. hirtellus* subsp. *setarius*

1A. *Oplismenus hirtellus* (L.) Beauv. var. *hirtellus*.

Hitchcock (Man. Grasses W. I. 324. 1936) has noted that there are two forms of this variety, one with glabrous sheaths and one with hispid sheaths. The two forms appear to be the same except for the leaf sheath indumentation.

GENERAL DISTRIBUTION: Southern Mexico and the Antilles south through South America.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe, St. Lucia, St. Vincent, the Grenadines, Grenada.

HABITAT: In moist, usually shady habitats, often along moist, shaded banks and wet bottoms in the forest.

This taxon was referred by Grisebach (Fl. Br. W. Ind. 545. 1864) to *Orthopogon loliaceus* Spreng. (*Oplismenus loliaceus* (Lam.) Beauv.), an Asiatic species.

1B. *Oplismenus hirtellus* (L.) Beauv. subsp. *setarius* (Lam.) Mez in Arkiv för Bot. 13: 33. 1913.

Basionym: *Panicum setarium* Lam., Tabl. Encycl. Méth. Bot. 1: 170. 1791.

Type: Tropical America.

Syn.: *Oplismenus setarius* (Lam.) Roem. & Schult., Syst. Veg. 2: 481. 1817.

GENERAL DISTRIBUTION: The same general distribution as the typical variety.

DISTRIBUTION IN LESSER ANTILLES: St. Martin, Antigua, Saba, St. Eustatius, St. Kitts, Guadeloupe, Dominica, Martinique, St. Lucia.

HABITAT: In the same habitats as the typical variety and possibly only representing a growth form.

Duss in 1883 and 1894 collected a variegated form of this subspecies on Martinique, indicating that it was introduced.

38. *ERIOCHLOA* Humboldt, Bonpland & Kunth

Eriochloa H.B.K., Nov. Gen. Sp. 1: 94. 1815.

Cespitose annuals and perennials, some with decumbent-spreading culms rooting at the lower nodes. Ligule a minute, membranous rim or ridge densely fringed with short hairs. Inflorescence a panicle of contracted or

spreading spicate branches, the sessile or short-pedicceled spikelets borne singly or in pairs. Disarticulation below spikelet. Spikelets 2-flowered, the upper floret perfect, the lower floret staminate or neuter. First glume absent or reduced to a short membrane and fused with the rachis node to form a cup or disc. Second glume oriented away from the rachis, the first glume and lemma of lower floret about equal, acute at apex. Lemma of upper floret firm or hard, glabrous, finely rugose, with slightly inrolled margins and with a stout, abruptly apiculate cusp or short awn.

TYPE SPECIES: *Eriochloa distachya* H.B.K.

A genus of about 20 species, widely distributed in the warmer parts of the world, but mostly in the Americas.

KEY TO THE SPECIES

1. First glume developed on at least some spikelets; culm nodes villous; spikelets mostly 3.2-3.8 mm. long, acute at apex. 1. *E. polystachya*
- 1a. First glume absent; culm nodes puberulent or glabrous; spikelets 4-5 mm. long, the tips of the second glume and lower lemma acuminate or short-awned. 2
2. Plants perennial; culms 60-100 cm. tall; leaf blades mostly 4-10 mm. broad; lemma of upper floret with a cusp usually about 1 mm. long. 2. *E. punctata*
- 2a. Plants annual; culms 30-40 cm. tall; leaf blades mostly 2-3 mm. broad; lemma of upper floret with a cusp about 0.5 mm. long. 3. *E. boxiana*

1. *Eriochloa polystachya* H.B.K., Nov. Gen. Sp. 1: 95, pl. 31. 1815.

Type: Ecuador.

Syn.: *Monachne subglabra* Nash in Bull. Torrey Bot. Club 30: 374. 1903.

Eriochloa subglabra (Nash) Hitchc. in Contr. U. S. Natl. Herb. 12: 208. 1909.

Culms 1-2 m. tall from a branching, decumbent or trailing base. Leaves minutely puberulent on collar and just above ligule. Ligule a ring of hairs 0.5-1.0 mm. long on a firm, elevated rim or collar. Blades mostly 6-15 cm. broad, glabrous except for the minute puberulence at base. Panicles mostly 15-25 cm. long, with spikelets mostly in pairs on loosely ascending branches. Branch rachis broad, scabrous, with a few stiff hairs on the margins and on the short pedicels. Spikelets in unequally pedicelled pairs or single. First glume often developed as a thin, short, broad, usually purple membrane. Second glume and lemma of lower floret sparsely strigose, blunt at apex, not acuminate.

GENERAL DISTRIBUTION: The Antilles and south to Brazil and Ecuador.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe, *Hitchcock 16400* (US).

HABITAT: Moist, marshy areas, common in ditches and swales.

2. *Eriochloa punctata* (L.) Desv. ex Hamilt., Prodr. 5. 1825.

Basionym: *Milium punctatum* L., Syst. Nat. ed. 10. 2: 872. 1759.

Type: Jamaica.

Syn.: *Monachne punctata* (L.) Nash in Bull. Torrey Bot. Club 30: 374. 1903.

Cespitose perennial with erect or spreading-erect culms 60–100 cm. or more tall. Culm nodes minutely puberulent. Leaves glabrous, the sheaths rounded. Blades thin, elongate, 5–15 mm. broad. Inflorescences 8–18 cm. long with usually 8–15 or more branches, these 2–6 cm. long. Inflorescence axis, branches and pedicels puberulent. Spikelets 4–5 mm. long. Glume and lemma of lower floret sparsely appressed-pilose, the glume often short-awned. Lemma of upper floret abruptly tipped with an awn 1.0–1.5 mm. long.

GENERAL DISTRIBUTION: Southern Louisiana and Texas to eastern Mexico, the Antilles, and south Argentina.

DISTRIBUTION IN LESSER ANTILLES: Antigua, Montserrat, Guadeloupe, Dominica, Martinique, St. Vincent, Grenada, Barbados.

HABITAT: Along watercourses, in swales and ditches.

3. *Eriochloa boxiana* Hitchc. ex Swallen in Carnegie Inst. Washington Publ. 436, Contr. to Amer. Archeology 12 (Appendix): 339. 1934.

Type: Antigua, Parry's Bridge, Box 43.

The following has been copied from the type description of *E. boxiana*. Annual, culms branching, decumbent and spreading at base, rooting at lower nodes, 30–40 cm. tall, glabrous, minutely puberulent at the nodes; sheaths glabrous, minutely puberulent on the collar; ligule a row of stiff hairs 0.5–1.0 mm. long; blades flat, ascending, glabrous beneath, puberulent on the upper surface, 5–12 cm. long, 2–3 mm. wide, long-acuminate; panicle contracted, 7–11 cm. long, the racemes numerous, the axis scabrous and short-pilose; racemes appressed or ascending, overlapping, 1.5–2.0 cm. long, the axis scabrous; spikelets in pairs, imbricate, lanceolate-acuminate, 4.5–5.0 mm. including the awn-tip, appressed pilose on the lower $\frac{2}{3}$, the tip minutely scaberulous, the pedicels about 0.5 mm. long, bearing a few slender hairs; basal ring not prominent, pale, the first glume wanting; second glume extending into an awn nearly 1 mm. long; sterile lemma smaller and a little shorter than the glume, acuminate-tipped rather than awned; fertile lemma elliptic-oblong, tipped with an awn 0.5 mm. long.

GENERAL DISTRIBUTION: Yucatan and Colombia.

DISTRIBUTION IN LESSER ANTILLES: Antigua, Parry's Bridge, Box 43 (us).

HABITAT: In moist, swampy, open land.

39. BRACHIARIA Grisebach

Brachiaria Griseb. in Ledeb., Fl. Ross. 4: 469. 1853.

FIGURE 33.

Low annuals and perennials mostly with spreading, decumbent or stoloniferous culms. Ligule a short fringed membrane. Inflorescence usually a few-flowered panicle, with spikelets on short, erect-spreading or spreading, spicate branches, these scabrous and frequently with a few long, stiff

hairs on the rachis and pedicels. Spikelets short-pediceled or sessile; solitary or less frequently paired, in two rows on either side of a 3-angled or narrowly winged rachis, oriented with the short first glume turned toward the rachis. Spikelets awnless, 2-flowered, the upper floret perfect, the lower floret staminate or sterile. Glumes unequal, the first short and broad, the second about as large as lemma of lower floret. Lemma of upper floret indurate, usually rugose in transverse lines, but occasionally smooth, with the margins inrolled over the palea.

TYPE SPECIES: *Brachiaria erucaiformis* (J. E. Smith) Griseb., based on *Panicum erucaiforme* J. E. Smith.

A genus of about 50 species, in tropical and subtropical regions of both hemispheres. Included in *Brachiaria* as presently treated and following the concepts of Parodi (in *Darwiniana* 15: 86-100. 1969) are the following species referred to *Panicum* by Hitchcock (Man. Grasses W. I. 247, 250-252. 1936): *B. fasciculata*, *B. reptans*, *B. adspersa*, *B. echinulata*, and *B. purpurascens*.

KEY TO THE SPECIES

1. Second glume and lemma of lower floret conspicuously cross-veined and reticulate to below middle, thin and more or less papery, dark brown to golden-brown; spikelets mostly 2.2-2.8 mm. long. 3. *B. fasciculata*
- 1a. Second glume and lemma of lower floret not cross-veined and reticulate, or if reticulate near apex then 3.2-4.0 mm. or more long, thin or rather firm, greenish or purple. 2
2. Second glume and lower lemma hairy or scabrous. 3
- 2a. Second glume and lower lemma glabrous. 5
3. Spikelets 2.5 mm. or less long. 1. *B. erucaiformis*
- 3a. Spikelets 3.2-4.0 mm. long. 4
4. Second glume and lower lemma not tuberculate-hispid, scabrous or with a few short hairs. 4. *B. adspersa*
- 4a. Second glume and lower lemma densely tuberculate-hispid with coarse hairs. 5. *B. echinulata*
5. Spikelets 1.8-2.0 mm. long. 2. *B. reptans*
- 5a. Spikelets 2.8-5.0 mm. long. 6
6. Spikelets in unequally pediceled pairs. 7
- 6a. Spikelets solitary on either side of the rachis. 8
7. Plants perennial, with stout, creeping stolons that are densely bearded at the nodes. 8. *B. purpurascens*
- 7a. Plants annual, often stoloniferous but the stolon nodes glabrous. 4. *B. adspersa*
8. Spikelets 3.2-3.8 mm. long. 6. *B. subquadriflora*
- 8a. Spikelets 4.0-4.8 mm. long. 7. *B. plantaginea*

1. *Brachiaria erucaiformis* (J. E. Smith) Griseb. in Ledeb., Fl. Ross. 4: 469. 1853.

Basionym: *Panicum erucaiforme* J. E. Smith in Sibth., Fl. Graec. Prodr. 1: 40. 1806.

Type: Greece.

Tufted annual with wiry, decumbent-spreading, much-branched culms, these often rooting at the lower nodes. Floriferous culms mostly 25–60 cm. tall. Lower sheaths rather densely hispid or pilose, especially at base on the sheath node, the upper sheaths often hairy only on the node. Ligule a dense, hairy rim. Blades hairy or glabrous, short, firm, flat, mostly 2–5 mm. broad. Inflorescence 5–8 cm. long, with usually 6–12 appressed-erect branches 1.0–2.5 cm. long. Branch rachis minutely hairy, flattened but narrow, bearing closely imbricated, small, hairy spikelets on short pedicels. First glume minute, nerveless. Second glume and lower lemma about equal, 1.8–2.0 mm. long, more or less hairy, slightly longer than the narrowly oblong lemma of the upper floret.

GENERAL DISTRIBUTION: India and Africa, southern Europe; adventive in the Lesser Antilles.

DISTRIBUTION IN LESSER ANTILLES: Antigua, Guadeloupe, Barbados.

HABITAT: Low, moist, open meadows, ditches and swales.

2. *Brachiaria reptans* (L.) Gard. & C. E. Hubb. in Hook., Icon. Pl. 3363: 3. 1938.

Basionym: *Panicum reptans* L., Syst. Nat. ed. 10. 2: 870. 1759.

Type: Jamaica.

Syn.: *Panicum prostratum* Lam., Tabl. Encycl. Méth. Bot. 1: 171. 1791. (Type: Dominican Republic, Santo Domingo.)

Panicum prostratum var. *pilosum* Eggers, Fl. St. Croix & Virgin Isl. 104. 1879. (Type: St. Croix.)

Mat-forming annual with widely creeping and branching culms, these usually rooting at the lower nodes. Erect floriferous culm branches mostly 10–35 cm. tall. Culm nodes glabrous or puberulent. Sheaths glabrous or hispid, usually with a fringe of hairs on margins. Ligule a minute, fringed membrane, the hairs 0.5–1.0 mm. long. Blades broad, short, flat, crisped or undulate on margins, cordate at base, mostly 1.5–7.0 cm. long and 4–12 mm. broad, ciliate on lower margins. Panicles 1.5–6.0 cm. long, with spikelets subsessile to short-pedicel, mostly in pairs with pedicels of unequal lengths, on simple or nearly simple, short, somewhat spreading branches. Branch rachis usually 1–4 cm. long, slender, 3-angled, with an occasional long stiff hair on the rachis or on the pedicels. Spikelets glabrous, rather uniformly 1.8–2.0 mm. long, with a broad, rounded or truncate first glume 1/4–1/5 as long as spikelet. Second glume and lower lemma about equal, broad, acute or slightly beaked at apex. Lower floret often staminate, with a palea about as long as lemma. Lemma and palea of upper floret finely transverse-rugose, with a minutely apiculate tip.

GENERAL DISTRIBUTION: Tropical and subtropical regions of the world, possibly adventive in the Americas.



FIGURE 33. Poaceae. a-c, *Brachiaria fasciculata*: a, habit, $\times 0.5$; b, spikelet, $\times 8$; c, floret, $\times 8$. (Reprinted from Gould, Grasses of the Texas Coastal Bend, p. 110, fig. 109. 1965.)

DISTRIBUTION IN LESSER ANTILLES: Anguilla, St. Martin, Antigua, St. Kitts, Montserrat, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Grenada, Barbados.

HABITAT: Moist soil, in open or partial shade, often weedy in disturbed soil.

3. *Brachiaria fasciculata* (Sw.) S. T. Blake in Proc. Roy. Soc. Queensland 81(1): 4. 1970.

Basionym: *Panicum fasciculatum* Sw., Prodr. 22. 1788.

Type: Jamaica.

Syn: *Panicum chartaginense* Sw., Prodr. 22. 1788. (Type: Columbia, Cartagena.)

Leafy annual with tufted or decumbent-creeping culms 30-120 cm. or more long, these often rooting at the nodes. Culm nodes usually appressed-pubescent, the internodes often puberulent or hispid also. Leaves glabrous or hispid, the hairs when present often papilla-based. Ligule a dense ring of hairs about 1 mm. long from a minute, membranous collar. Blades flat, firm, lanceolate, mostly 5-25 cm. long and 5-20 mm. broad. Panicles mostly 8-20 cm. long, the spikelets short-pedicel, single, paired or fascicled on short, racemose branches. Branch rachis and pedicels slender, 3-angled, usually with a few scattered long hairs on the angles. Spikelets 2.2-2.8 mm. long, the broad first glume $\frac{1}{3}$ - $\frac{1}{4}$ as long as the spikelet. Second glume and lemma of lower floret broad, thin, irregularly reticulate, abruptly pointed. Lemma and palea of upper floret coarsely rugose in transverse lines, broadly acute or abruptly blunt-pointed.

GENERAL DISTRIBUTION: Florida to Arizona and southward through Mexico and the Antilles to northern South America.

DISTRIBUTION IN LESSER ANTILLES: Anguilla, St. Martin, Antigua, Saba, St. Eustatius, St. Kitts, Montserrat, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, the Grenadines, Grenada, Barbados.

HABITAT: Moist, open soil, usually in disturbed habitats, often weedy and abundant.

4. *Brachiaria adspersa* (Trin.) Parodi in Darwiniana 15: 96. 1969.

Basionym: *Panicum adspersum* Trin., Gram. Pan. 146. 1826.

Type: Dominican Republic, Santo Domingo.

Coarse, leafy annual with erect or decumbent and spreading culms, these often rooting at the lower nodes, 30-120 cm. or more long or tall. Sheaths usually ciliate on margins, often densely so. Ligule a ciliate membrane, the hairs about 1 mm. long. Blades typically glabrous, lanceolate with a slightly cordate base, mostly 6-20 cm. long and 8-20 mm. broad. Panicles 6-15 cm. long, with slender, erect-spreading, spicate branches up to 10 cm. long. Panicle branches 3-angled, scabrous on the angles and puberulent at the branch base. Spikelets 3.2-4.0 mm. long, mostly in unequally pedicel pairs. First glume broad, usually 3- to 5-nerved, $\frac{1}{4}$ - $\frac{1}{3}$ as long as spikelet.

Second glume and lower lemma about equal, abruptly short-acuminate at tip, occasionally faintly reticulate above middle, glabrous or often variously hairy with short or long hairs above the middle. Lemma and palea of upper floret finely cross-reticulate, usually minutely apiculate at apex.

GENERAL DISTRIBUTION: Florida and the Antilles.

DISTRIBUTION IN LESSER ANTILLES: Anguilla, St. Martin, Antigua, Saba, St. Kitts, Nevis, Montserrat, Guadeloupe, Martinique, St. Lucia, Grenada.

HABITAT: In loose, open ground, often along ditches and in other disturbed areas.

5. *Brachiaria echinulata* (Mez) Parodi in Darwiniana 15: 94. 1969.

Basionym: *Panicum echinulatum* Mez in Notizbl. Bot. Gart. Berlin 7: 62. 1917.

Type: Paraguay.

Tufted, leafy annual, similar in general aspect to *B. adspersa* but the second glume and lemma of lower floret hispid with coarse papilla-based hairs up to 1 mm. long, the spikelets typically bristly with stiff, spreading hairs.

GENERAL DISTRIBUTION: Antilles, Paraguay and Bolivia; possibly adventive in the Antilles.

DISTRIBUTION IN LESSER ANTILLES: St. Kitts, Nevis.

HABITAT: Low, open habitats, often a weed of disturbed sites.

Brachiaria echinulata is close to *B. adspersa* and may intergrade with that taxon through forms with varying types and amounts of spikelet indumentation. A similar series may connect these two taxa with *Brachiaria molle* (Sw.) Parodi, which has hairy rather than scabrous inflorescence branches and considerable variation in type and amounts of hairs on the spikelet.

6. *Brachiaria subquadripara* (Trin.) Hitchc. in Lignan Sci. Jour. 7: 214. 1931.

Basionym: *Panicum subquadriparum* Trin., Gram. Pan. 145. 1826.

Type: Marianne Islands.

A stout or slender perennial with weak, decumbent or creeping culms to 45 cm. tall, with erect tips. Culm nodes glabrous or somewhat hairy. Sheaths softly ciliate on margins. Ligule a ciliate membrane or collar mostly less than 1 mm. long. Blades thin, glabrous on surfaces but occasionally ciliate at base, 5-20 cm. long, mostly 4-12 mm. broad, tapering to an acuminate tip. Panicle branches usually 3-6, widely spaced on the glabrous or slightly hispid main axis, mostly 2.5-9.0 cm. long. Spikelets glabrous, solitary and loosely spaced on a flattened rachis, 3.2-3.8 mm. long, narrowly elliptic, sharply acute and not acuminate or apiculate at apex. Lower glume half the length of spikelet or slightly less, obtuse at

apex. Lower floret neuter. Lemma and palea of upper floret finely rugose and transversely wrinkled.

GENERAL DISTRIBUTION: India, China, Malaya, introduced into eastern Mexico and the Antilles.

DISTRIBUTION IN LESSER ANTILLES: Grenada, known only from a recent collection made in a road ditch in St. George's, *Gould 15180* (TAES).

HABITAT: A weedy perennial that often appears annual, usually growing in moist soil of ditches and other low, often disturbed sites.

7. *Brachiaria plantaginea* (Link) Hitchc. in Contr. U. S. Natl. Herb. 12: 212. 1909.

Basionym: *Panicum plantagineum* Link, Hort. Berol. 1: 206. 1827.

Type: Grown in Berlin, origin unknown.

Leafy, tufted annual with weak, usually decumbent and spreading culms, these often rooting at the lower nodes. Sheaths ciliate on margins, the lowermost often pilose on back. Ligule a ring of short hairs on a firm, membranous collar, not over 1 mm. long. Blades broad and flat, mostly 7-15 mm. broad, usually tapering from a broad, subcordate base to a slender tip. Inflorescence a panicle with usually 2-5 loosely erect or spreading branches 3-6 cm. long. Branch rachis 0.3-1.5 mm. broad. Spikelets on pedicels 0.3-0.8 mm. long, in two rows on a flattened rachis 0.3-1.5 mm. broad. Spikelets glabrous, mostly 4.0-4.8 mm. long, First glume $\frac{1}{4}$ - $\frac{1}{3}$ as long as spikelet, mostly 5- to 7-nerved. Second glume and lower lemma about equal, the lemma usually apiculate. Palea of lower floret about as long as the lemma. Lemma and palea of upper floret minutely transverse-rugose, the lemma obtuse at apex.

GENERAL DISTRIBUTION: Mexico and the Antilles to Brazil and Bolivia.

DISTRIBUTION IN LESSER ANTILLES: St. Lucia, *Sturrock 516*(A).

HABITAT: Low, moist flats, ditches and streambanks.

8. *Brachiaria purpurascens* (Raddi) Henr. in Blumea 3: 434. 1940.

Basionym: *Panicum purpurascens* Raddi, Agrost. Bras. 47. 1823.

Type: *Raddi*, Brazil, Rio de Janeiro.

Syn.: *Panicum barbinode* Trin. in Mem. Acad. St. Petersb. VI Sci. Nat. 1: 256. 1834. (Type: Brazil, Bahia.)

Panicum guadaloupense Steud., Syn. Pl. Glum. 1: 61. 1854. (Type: Guadeloupe.)

Perennial with thick, decumbent, trailing culms as much as 4-5 m. long. Culm nodes (actually the sheath bases) densely bearded. Sheaths hairy or puberulent on collar, the lower ones usually hispid on back. Ligule a membranous collar fringed with hairs about 1 mm. long. Blades long and broad, mostly 7-15 mm. wide, usually hirsute at least on the abaxial surface. Panicles mostly 12-20 cm. long, usually with 8-18 erect-spreading

branches 2-9 cm. long, these simple or the lower ones with short, secondary branches. Panicle branches and pedicels usually more or less hispid, with long, silvery hairs. Spikelets glabrous, 2.8-3.5 mm. long, in unequally pediceled pairs on the angular, slightly winged rachis. First glume $\frac{1}{3}$ the length of spikelet or less, the second glume and lower lemma about equal. Lower floret usually staminate, with a palea as long as or longer than the lemma. Lemma and palea of upper floret minutely rugose.

GENERAL DISTRIBUTION: Widely distributed in tropical America, introduced in many areas as a forage grass.

DISTRIBUTION IN LESSER ANTILLES: St. Martin, Antigua, St. Eustatius, St. Kitts, Montserrat, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Grenada, Barbados.

HABITAT: Low, moist meadows, mostly as an escape from pasture plantings.

40. AXONOPUS Beauvois

Axonopus Beauv., Ess. Agrost. 12. 1812.

FIGURE 34.

Plants mostly perennial, a few annual, with culms in tufts but often with rhizomes and creeping stolons. Ligule a short ciliate membrane. Blades tending to be long and rather thick. Inflorescence with 2 (rarely 1)-several slender, spicate branches, the spikelets solitary at the nodes and rather widely spaced in 2 rows on 2 sides of a triangular, often somewhat winged rachis. Spikelets awnless, 2-flowered, the lower floret staminate or neuter, the upper perfect, with the back of lemma of upper floret oriented away from rachis. Disarticulation below spikelet. First glume absent, second glume and lemma of lower floret about equal, narrowly ovate or oblong. Lemma and palea of upper floret oblong, glabrous, usually obtuse at apex.

TYPE SPECIES: *Axonopus compressus* (Sw.) Beauv., based on *Milium compressum* Sw.

A genus of 100 or more species, all native to the American tropics and subtropics.

KEY TO THE SPECIES

1. Plants perennial; spikelets 1.6-3.1 cm. long. 2
- 1a. Plants annual; spikelets 1.2-1.6 mm. long. 3. *A. capillaris*
2. Blades with convolute perfoliation in bud; anthers yellow; spikelets 2.0-3.1 mm. long; stolons usually present and extensive. 1. *A. compressus*
- 2a. Blades folded but without convolute perfoliation in bud; anthers purple; spikelets 1.6-2.1 mm. long; stolons infrequent. 2. *A. affinis*

1. *Axonopus compressus* (Sw.) Beauv., Ess. Agrost. 154. 1812.

Basionym: *Milium compressum* Sw., Prodr. 24. 1788.

Type: *Shakespeare*, Jamaica (BM, isotype?).

Syn.: *Paspalum filostachyum* A. Rich. ex Steud., Syn. Pl. Glum. 1: 20. 1854. (Type: *Duchassaing s.n.*, Guadeloupe (P).)

Stoloniferous perennial, the stolons often strongly flattened, wiry, with internodes usually 3–20 cm. long, the culms to as much as 1 m. long. Erect culms leafy, mostly 15–60 cm. tall, the flowering shoots usually with 1 or 2 nodes, these hairy or glabrescent. Sheaths glabrous to hairy, the lower 2–5 cm. long, the upper 7–20 cm. long, strongly compressed and keeled. Ligule a minute, fringed, membranous rim, short-ciliate. Blades with convolute perfoliation in bud, mostly 3–25 cm. long and 3–20 mm. broad, usually blunt at tip, glabrous or sparingly hairy on the surfaces, usually ciliate on margins at tip. Midnerve of blade prominent, often whitish. Peduncle of panicle slender, short and partially enclosed in the sheath to long-exserted. Panicle branches 2–3(–5), ascending or spreading, 1–13 cm. long. Branch rachis glabrous, 0.3–0.5 mm. broad. Spikelets sessile, 2.0–3.1 mm. long, lanceolate to ovate. Glume and lower lemma about equal, brownish to dark purple, sparingly hairy along lateral nerves or glabrous, 2- to 5-nerved, the midnerve often suppressed. Anthers yellow, about $\frac{1}{2}$ as long as those of *A. affinis*.

GENERAL DISTRIBUTION: Southern United States, the Antilles, Central America through South America to southern Brazil, Bolivia, Uruguay and Peru; widely distributed in the warmer parts of Africa, Asia, the Pacific islands and Australia.

DISTRIBUTION IN LESSER ANTILLES: Antigua, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Grenada, Barbados.

HABITAT: Low, open fields, often in ditches and marshy land.

Black (in Adv. Front. Pl. Sci. 5: 72–83. 1963) recognized 5 varieties in the species *A. compressus*. The above description is based on the typical variety, *A. compressus* (Sw.) Beauv. var. *compressus*, the only variety that occurs in the Lesser Antilles.

2. *Axonopus affinis* Chase in Jour. Washington Acad. Sci. 28: 180, fig. 2. 1938.

Type: *Kearney 175*, Waynesboro, Mississippi (US, holotype).

Similar to the widespread *A. compressus* but differing in the key characters.

GENERAL DISTRIBUTION: Southern United States, the Antilles and Mexico south through Uruguay and Paraguay to Argentina; also reported on Pacific islands and Australia.

DISTRIBUTION IN LESSER ANTILLES: Grenada, *Broadway 1817*(GH).

HABITAT: Low, moist pastureland, often in ditches and along swales.



FIGURE 34. Poaceae. a-d, *Stenotaphrum secundatum*: a, habit, $\times 0.3$; b, c, two views of spikelet, $\times 10$; d, fertile floret, $\times 10$. e, f, *Axonopus affinis*: e, habit, $\times 0.1$; f, spikelet, $\times 5$. (a-d, reprinted from Hitchcock, Manual of the grasses of the United States, p. 845, fig. 588. 1951; e, f, reprinted from Gould, Grasses of the Texas Coastal Bend, p. 32, fig. 24. 1965.)

3. *Axonopus capillaris* (Lam.) Chase in Proc. Biol. Soc. Washington 24: 133. 1911.

Basionym: *Paspalum capillare* Lam., Tabl. Encycl. Méth. Bot. 1: 176. 1791.

Type: Tropical America.

Syn.: *Anastrophus capillaris* (Lam.) Nash, N. Am. Fl. 17: 161. 1912.

Delicate, tufted annual with culms 10–70 cm. tall, often branching at base and sometimes decumbent below and rooting at lower nodes. Culm nodes numerous, glabrous. Sheaths shorter than internodes, keeled or not. Ligule a short-ciliate membrane. Blades 2–10 cm. long, 3–8 mm. broad, densely pilose at base, glabrous or pilose on adaxial surface. Panicles often long-exserted on slender peduncles, with 2–6 ascending or spreading branches 2–8 cm. long. Rachis 0.3–0.5 mm. broad, green or brown. Spikelets sessile, 1.2–1.6 mm. long, elliptical, obtuse or acute at apex. Glume and lower lemma equal, glabrous or sparsely hairy, 2- to 4-nerved, the midnerve suppressed. Upper floret about as long as spikelet, brown, shiny, glabrous.

GENERAL DISTRIBUTION: Throughout tropical America from the Antilles and Central America to Brazil and Paraguay.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe, *Stehlé* 569 (US), *Questel* 4075 (US).

HABITAT: Open, moist or marshy areas, often in ditches and swales.

41. STENOTAPHRUM Trinius

***Stenotaphrum* Trin., Fund. Agrost. 175. 1820.**

FIGURE 34.

Creeping or decumbent-erect annuals and perennials, all species rooting at nodes. Culms and leaf sheaths generally compressed. Blades flat, rather thick. Ligule a line of hairs. Inflorescences terminal and axillary, spikelike, flattened or cylindrical, with several to many short, few-flowered, closely placed branches partially embedded in one side of a thick, corky axis. Disarticulation at nodes of rachis, the spikelets falling attached to the sections. Spikelets awnless, 2-flowered, the upper floret perfect, the lower floret staminate or neuter. First glume short, the second about as long as lemma. Lemma of upper floret firm, ovate, pointed, with thin margins.

TYPE SPECIES: *Stenotaphrum glabrum* Trin., now correctly known as *Stenotaphrum secundatum* (Walt.) O. Kuntze.

A genus of seven species, in tropical and subtropical regions of Africa, the Americas, Hawaii and other Pacific islands, and Australia.

1. *Stenotaphrum secundatum* (Walt.) O. Kuntze, Rev. Gen. Pl. 2: 74. 1891.

Basionym: *Ischaemum secundatum* Walt., Fl. Carol. 249. 1788.

Type: South Carolina.

Low, mat-forming, stoloniferous perennial, culms stout, decumbent, much-branched, with erect, floriferous branches 10–30 cm. tall. Leaves glabrous except the sheath margins occasionally sparsely ciliate and the ligule a fringed membrane with minute, stiff hairs. Blades thick, 4–10 mm. broad, mostly 3–15 cm. long but longer on sterile shoots, blunt and rounded at apex. Inflorescence spike-like, flattened, 5–10 cm. long, the short, stout appressed branches bearing 1–3 sessile or subsessile spikelets. Spikelets awnless, 4–5 mm. long. First glume short, irregularly rounded, the second about equaling the lower lemma and similar to it.

GENERAL DISTRIBUTION: Southern United States, the Antilles, eastern Mexico, Central America and South America to Argentina, mainly along the eastern coastal region.

DISTRIBUTION IN LESSER ANTILLES: Antigua, St. Kitts, Guadeloupe, Dominica, Martinique, St. Lucia. Possibly on all of the islands as an introduced lawn grass.

HABITAT: Low, moist, open areas, often in sandy soil.

A variegated form was collected by the author in the Andromeda Gardens on Barbados, and also in a flower bed in St. George's, Grenada.

42. PASPALIDIUM Stapf

Paspalidium Stapf in Prain, Fl. Trop. Afr. 9: 582. 1920. FIGURE 35.

Perennials, mostly of moist or marshy habitats. Culms frequently thick, spongy, and stoloniferous below, commonly rooting at the lower nodes. Ligule a short, fringed membrane. Blades thick, flat or folded. Inflorescence a contracted panicle with few to numerous short, erect, spike-like branches scattered on the upper 6–40 cm. of the main axis. Spikelets closely placed and imbricated on the branch rachis, 2-flowered, the upper floret perfect, the lower floret staminate or neuter. Disarticulation below glumes. Glumes broad, rounded, unequal, glabrous. Lemma of upper floret firm, cartilaginous, with margins inrolled over a palea of the same texture.

TYPE SPECIES: *Paspalidium geminatum* (Forssk.) Stapf, based on *Panicum geminatum* Forssk.

A genus of about 20 species, in the warmer parts of both hemispheres.

1. *Paspalidium geminatum* (Forssk.) Stapf in Prain, Fl. Trop. Afr. 9: 583. 1920.

Basionym: *Panicum geminatum* Forssk., Fl. Aegypt.-Arab. 18. 1791.

Type: Egypt.

Perennial with thickish, glabrous culms in clumps from a firm, often somewhat rhizomatous base. Blades linear, 3–6 mm. broad. Inflorescence an elongated panicle with subsessile and closely placed spikelets on 7–17 short, erect, spicate branches, the spikelets single at the nodes, widely

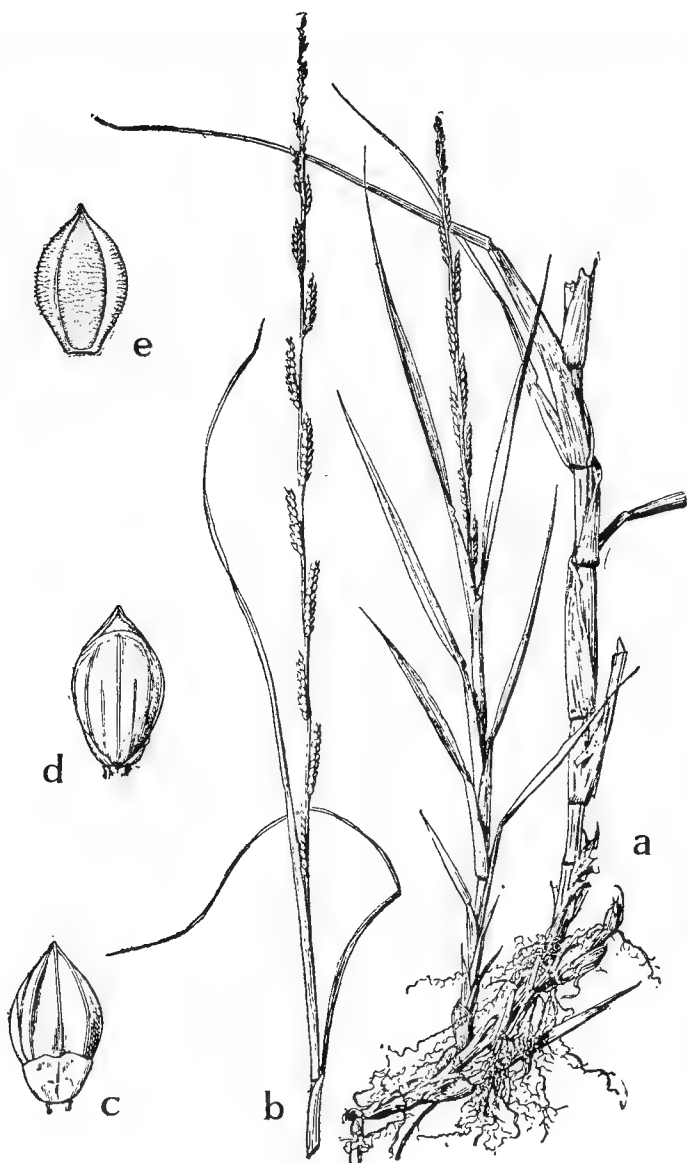


FIGURE 35. Poaceae. a-d, *Paspalidium geminatum*: a, culm base, $\times 0.5$; b, inflorescence, $\times 0.5$; c, d, two views of spikelet, $\times 10$, e, floret, $\times 10$. (Reprinted from Hitchcock, Manual of the grasses of the West Indies, p. 248, fig. 197. 1936.)

spaced below and progressively closer and shorter above. Spikelets in two rows on a flattened rachis, oriented with the rounded back of lemma of upper floret turned toward the rachis as in *Paspalum*. Spikelets 2.2-3.0 mm. long, broadly ovate, glabrous. First glume $\frac{1}{4}$ - $\frac{1}{2}$ as long as spikelet. Lemma of upper floret finely rugose, acute at apex.

GENERAL DISTRIBUTION: Southern United States and the Antilles south through Mexico, Central America and tropical South America; also in the Old World tropics.

DISTRIBUTION IN LESSER ANTILLES: Anguilla, St. Martin, Antigua, St. Kitts, Montserrat, Guadeloupe, Dominica, Martinique, St. Vincent, Grenada, Barbados.

HABITAT: Moist or marshy land, often along ditches, rivers and lakes.

43. PASPALUM Linnaeus

Paspalum L., Syst. Nat. ed. 10. 2: 855. 1759.

FIGURE 36.

Species mostly perennial, a few annual, frequently with rhizomes or stolons. Ligule a short membrane or ring of hairs. Blades usually flat, often thin and rather broad. Inflorescence with 1-many unilateral, simple primary branches, these few and scattered, numerous and clustered, or solitary or paired at the culm apex. Spikelets sessile or short-pedicel in 2 or 4 rows on a flattened, often broad and winged rachis. Spikelets awnless, flattened on one side and rounded on the other, 2-flowered, the upper floret perfect, the lower floret staminate or neuter. Spikelets oriented with the rounded back of lemma of upper floret oriented toward the rachis. First glume typically absent but irregularly present in a few species. Second glume and lemma of lower (reduced) floret usually about equal, broad and rounded or less frequently acute; lemma of lower floret flat or only slightly convex. Lemma and palea of upper floret smooth and shiny, the lemma with inrolled margins, completely enfolding the flattened palea.

TYPE SPECIES: *Paspalum dissectum* (L.) L., based on *Panicum dissectum* L.

Paspalum, with about 400 species, is one of the largest genera of grasses. For the most part the species are confined to tropical and subtropical regions with only a few ranging into the temperate zones of both hemispheres.

KEY TO THE SPECIES

1. Inflorescence branches 2, paired or less than 1 cm. apart (1 or 2 additional branches infrequently present below); spikelets single at the rachis nodes. 2
- 1a. Inflorescence branches 1-numerous, when 2 then the branches 1-2 cm. or more apart; spikelets single or paired at the rachis nodes. 7
2. Spikelets broadly ovate, elliptic or obovate, obtuse or broadly acute at apex. 3
- 2a. Spikelets narrowly ovate or elliptic, tapering to an acute apex; spikelets solitary at the rachis nodes, not paired. 5

3. Spikelets 1.4–2.0 mm. long; culms not from stout, scaly rhizomes. 4
- 3a. Spikelets 2.8–4.0 mm. long; plants with short, stout scaly rhizomes.
..... 3. *P. notatum*
4. Plants with slender, creeping stolons; spikelets sparsely ciliate on margins
with long, silky hairs. 1. *P. conjugatum*
- 4a. Plants without slender, creeping stolons; spikelets glabrous or puberulous but
not ciliate. 2. *P. pumilum*
5. Second glume and lemma of lower floret glabrous. 6
- 5a. Second glume and lemma of lower floret appressed-pubescent.
..... 6. *P. distichum*
6. Spikelets relatively widely spaced in 2 rows on a narrow, zigzag rachis, the
spikelets usually not overlapping the one immediately above on the same side;
blades, at least those above the base, filiform-involute, mostly 1 mm. or less
broad. 4. *P. distachyon*
- 6a. Spikelets relatively closely spaced in 2 rows on either side of a rather broad,
straight rachis, the spikelets overlapping the one immediately above on the
same side of the rachis; blades narrow, flat or folded but not filiform.
..... 5. *P. vaginatum*
7. Inflorescence branches 1–9. 8
- 7a. Inflorescence branches 10–numerous. 21
8. Spikelets fringed with long hairs or the glume margin with a broad, fimbriate
wing. 9
- 8a. Spikelets not fringed with long hairs or broadly winged on margins. 10
9. Plants annual; spikelets not fringed with long hairs; second glume with a
broad, membranous, dissected margin. 7. *P. fimbriatum*
- 9a. Plants perennial; spikelets fringed with long hairs; second glume not with a
broad, winged margin. 8. *P. dilatatum*
10. Mature fruit dark brown. 11
- 10a. Mature fruit light brown, straw-colored, or reddish-brown. 12
11. Plants perennial; spikelets 2.5–2.8 mm. long. 9. *P. plicatulum*
- 11a. Plants annual; spikelets about 2 mm. long. 10. *P. melanospermum*
12. Spikelets 1.0–1.2 mm. long, suborbicular and with slightly winged glume mar-
gins; plants with long, leafy, creeping stolons. 11. *P. orbiculatum*
- 12a. Spikelets 1.6–2.5 mm. long, ovate to obovate, not winged on margins; plants
stoloniferous or not. 13
13. Inflorescence branches, at least some, more than 10 mm. long; spikelets 2.2–
2.7 mm. long, glabrous. 17. *P. pleostachyum*
- 13a. Inflorescence branches 2–10 cm. long; spikelets 1.6–2.2 mm. long. 14
14. First glume present on all spikelets. 14. *P. decumbens*
- 14a. First glume absent or irregularly developed. 15
15. Base of plant densely tufted, with numerous culms and narrow basal blades;
blades 2–4 mm. broad and usually not over 15 cm. long; spikelets
glabrous. 12. *P. bakeri*
- 15a. Base of plant tufted or not, without numerous narrow basal blades; blades, at
least some, 5–15 mm. broad and often more than 15 cm. long. 16
16. Upper spikelet of pair on pedicel mostly 1.0–1.5 mm. long, spikelets loosely
arranged on a slender rachis; spikelets minutely puberulent. 13. *P. molle*
- 16a. Upper spikelet of pair on pedicel mostly less than 1 mm. long; spikelets gla-
brous or puberulent. 17
17. Blades stiff, often involute, commonly 25–50 cm. long; panicle branches 5–10,
the spikelets irregularly congested on the branch; spikelets glabrous. 18

- 17a. Blades not stiff, mostly 15-30 cm. long but occasionally longer; inflorescence a spicate raceme or panicle with usually 2-5 branches, the spikelets not congested on the branch; spikelets glabrous or puberulent. 19
18. Spikelets broadly oblong or obovate; pedicels glabrous or scabrous. 19. *P. nesiotes*
- 18a. Spikelets narrowly oblong or obovate; pedicels pubescent. 17. *P. pleostachyum*
19. Plants decumbent-spreading, commonly rooting at lower nodes; blades usually stiff, short, appressed, with papilla-based hairs on one or both surfaces, occasionally nearly glabrous; spikelets glabrous or infrequently with a few rather long hairs on margins of second glume; first glume often present as a rudiment on some spikelets. 15. *P. nutans*
- 19a. Plants erect or spreading, not rooting at lower nodes; blades glabrous to variously hairy; spikelets usually puberulent, at least on second glume; first glume absent on all spikelets. 20
20. Inflorescences terminal on main axis, lateral inflorescences rarely produced; inflorescence branches 3-6; blades commonly 20-30 cm. long, 3-8 mm. broad. 18. *P. laxum*
- 20a. Inflorescences commonly developed at the upper nodes as well as at the culm apex; inflorescence a spicate raceme or of 2-3 racemose branches; leaves commonly 4-12(-15) mm. broad. 16. *P. setaceum* var. *ciliatifolium*
21. Spikelets 4-5 mm. long, pubescent or ciliate. 23. *P. fasciculatum*
21. Spikelets 1.2-3.0 mm. long, glabrous or hairy. 22
22. Spikelets broadly ovate to broadly obovate or suborbicular, glabrous or pubescent but not fringed with long hairs. 23
- 22a. Spikelets narrowly ovate or lanceolate. 28
23. Spikelets 1.6-2.5 mm. long. 24
- 23a. Spikelets 1.2-1.5 mm. long. 22. *P. paniculatum*
24. Spikelets pubescent at apex, chestnut brown in color. 21. *P. virgatum*
- 24a. Spikelets glabrous, greenish, purple, or brown. 25
25. Panicle branches relatively slender, the spikelets not closely placed and in 4 well-defined rows. 17. *P. pleostachyum*
- 25a. Panicle branches thick, the spikelets closely placed and crowded in 4 regular rows. 26
26. Spikelets obovate-elliptic, 2.3-2.8 mm. long; panicle branches commonly 12-18. 20. *P. arundinaceum*
- 26a. Spikelets suborbicular, 1.9-2.4 mm. long. 27
27. Panicle branches usually 50-100, the apical branches often short, giving the panicle a pyramidal shape; spikelets light brown or slightly purple. 25. *P. densum*
- 27a. Panicle branches usually 10-30, the panicle not appearing pyramidal; spikelets green or purple-tinged. 24. *P. millegrana*
28. Panicle branches erect, 2-7 cm. long, not flexuous; spikelet ovate. 26. *P. urvillei*
- 28a. Panicle branches flexuous and spreading, 15-20 cm. or more long, spikelets lanceolate. 27. *P. saccharoides*

1. *Paspalum conjugatum* Bergius in Acta Helv. Phys. Math. 7: 129, pl. 8. 1762.

Type: Dutch Guiana.

Low perennial with culms single or in small clumps from an extensive system of glabrous, wiry, spreading stolons. Flowering culms or branches commonly 20–50 cm. tall, occasionally to 1 m. tall. Nodes of the erect culms glabrous or pubescent, those of the stolons usually conspicuously pubescent. Sheaths ciliate on margins. Ligule a membrane commonly 1.0–1.5 mm. long. Blades flat, thin, elongate, 5–15 mm. broad, glabrous except for ring of stiff hairs above the ligule or thinly scabrous, hispid or pilose on one or both surfaces. Inflorescence branches 2, slender, paired or nearly so, with rarely a third branch below, widely spreading at maturity, commonly 7–15 cm. long. Branch rachis slender, flattened and narrowly winged, the peduncle thinly to densely hairy at base. Spikelets solitary at the nodes, short-pedicelled in rows along either side of the rachis. Spikelets suborbicular, 1.4–2.2 mm. long, fringed with long, soft hairs on the margins, broadly acute, obtuse, or minutely apiculate at apex, usually pale yellow.

KEY TO THE VARIETIES

1. Spikelets 1.4–1.8 mm. long; inflorescence branches commonly less than 12 cm. long. 1A. *P. conjugatum* var. *conjugatum*
- 1a. Spikelets mostly 2.0–2.2 mm. long; inflorescence branches often more than 12 cm. long. 1B. *P. conjugatum* var. *pubescens*

1A. *Paspalum conjugatum* var. *conjugatum*.

GENERAL DISTRIBUTION: Common throughout the warmer regions of the Americas, where it probably is native, and also widespread throughout the Old World tropics.

DISTRIBUTION IN LESSER ANTILLES: The species *P. conjugatum* without varietal segregation has been reported from 13 Lesser Antillean Islands (St. Martin, Antigua, Saba, St. Kitts, Montserrat, Guadeloupe, Marie Galante, Dominica, Martinique, St. Lucia, St. Vincent, Grenada, Barbados).

HABITAT: A common weed of ditches, roadsides, heavily grazed pastures and wasteplaces, growing from sea level to 1500 meters.

1B. *Paspalum conjugatum* var. *pubescens* Doell in Mart., Fl. Bras. 2(2): 55. 1877.

Type: Brazil.

Generally similar to the typical variety but characteristically with larger spikelets, longer inflorescence branches and more pubescent spikelets.

GENERAL DISTRIBUTION: With the same range of the typical variety in the Americas and the Antilles but less frequent.

DISTRIBUTION IN LESSER ANTILLES: Accurate records have not been kept for this variety, but it has been collected on St. Kitts, Martinique, St. Vincent, Grenada, Barbados.

HABITAT: Same habitat as the typical variety.

2. *Paspalum pumilum* Nees, Agrost. Bras. 52. 1829.

Type: Brazil.

Tufted perennial with a firm or hard base but without stolons or creeping rhizomes. Culms mostly 12-35(-60) cm. tall, unbranched above the leafy plant base. Leaves from nearly glabrous to densely soft-pubescent throughout. Ligule a minute membrane, with a dense row of stiff hairs behind (above) it. Blades firm, flat, mostly 1.5-12.0 cm. long and 3-7 mm. broad, with parallel sides and an acute apex. Inflorescence branches 2, paired or nearly so, with a third branch occasionally produced below. Branches slender, mostly 2-7 cm. long, curving outward at the tips, with spikelets solitary, closely placed and subsessile in 2 rows on a glabrous, flattened but narrow rachis. Spikelets 1.6-2.0 mm. long, glabrous, broadly rounded, obtuse at apex.

GENERAL DISTRIBUTION: Trinidad, Colombia, Uruguay and Chile.

DISTRIBUTION IN LESSER ANTILLES: Dominica, Jones 39, Howard 11739.

HABITAT: Moist, open meadows.

3. *Paspalum notatum* Flugge, Monogr. Pasp. 106. 1810.

Type: Virgin Islands, St. Thomas.

Syn.: *Paspalum taphrophyllum* Steud., Syn. Pl. Glum. 1: 19. 1854. (Type: Martinique.)

Perennial with culms mostly 20-75 cm. tall, arising singly or in small clumps from short, stout, scaly rhizomes or stolons, the rhizomes or stolons usually with broad, firm, shiny, persistent, closely imbricated sheaths and often much more slender, soon-withering blades. Culm leaves with laterally compressed and keeled sheaths. Ligule a short membrane with a dense row of hairs behind it. Blades flat or folded, mostly 2-6 mm. broad but occasionally broader, often with long, slender tips but the uppermost blades usually greatly reduced. Inflorescence branches 2, paired or nearly so, occasionally a third branch developed below. Branches 4-7(-12) cm. long, usually spreading at a narrow angle. Spikelets solitary, in two rows along the firm, flattened, glabrous rachis. Spikelets glabrous, broadly ovate to obovate, mostly 2.8-3.5 mm., occasionally slightly shorter or longer, broadly acute or obtuse at apex.

GENERAL DISTRIBUTION: Native to the Antilles, eastern Mexico, Central America and eastern South America, introduced in the warmer parts of the United States as a forage grass under the name of Bahia grass.

DISTRIBUTION IN LESSER ANTILLES: St. Martin, Antigua, Montserrat, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Grenada.

HABITAT: Grasslands and savannas from sea level to elevations of 2000 meters or more; a coarse, tough, persistent pasturegrass.

4. *Paspalum distachyon* Poit. in Trin., in Mem. Acad. St. Petersburg. VI
Sci. Nat. 1: 142. 1834.

Type: Poiteau, Santo Domingo(?).

Perennial with slender, yellowish rhizomes often forming tough sods. Culms slender, firm, glabrous, 12-40 cm. tall, single or 2-3 at the rhizome nodes. Sheaths slender, often with a few, coarse, papilla-based hairs on the margins near the apex. Ligule a minute membrane, usually less than 0.5 mm. long. Lowermost blades of culm flat or folded, 1-2 mm. broad, the upper culm blades usually involute and not appearing over 1 mm. broad, infolded, as much as 15 cm. long. Inflorescence branches mostly 2, usually erect, 1.2-5.0 cm. long. Branch rachis narrow, flattened or slightly triangular, zigzag with rounded curves, bearing loosely spaced spikelets on short, puberulent pedicels. Spikelets glabrous, narrowly ovate or elliptic, tapering rather gradually to an acute apex, 2.7-3.0 mm. long.

GENERAL DISTRIBUTION: Endemic to the Antilles from Cuba to Dominica.

DISTRIBUTION IN LESSER ANTILLES: Dominica, one collection "probably Poiteau" (US).

HABITAT: Sandy shores along ocean and bordering brackish coastal inlets.

5. *Paspalum vaginatum* Sw., Prodr. 21. 1788.

Type: Jamaica.

Syn.: *Paspalum brachiatum* Trin. in Nees, Agrost. Bras. 62. 1829. (Type: Martini-
nique.)

Perennial with extensive, creeping rhizomes and stolons, often forming extensive colonies. Culms mostly 10-60 cm. tall. Culm nodes glabrous. Sheaths broad (broader than the blades), short, often closely imbricated, glabrous, straw-colored. Ligule a rounded membrane 0.5-2.0 mm. long, with a row of long, stiff hairs immediately above. Blades typically glabrous, 3-15 cm. long and 1-4 mm. broad, often folded on drying. Inflorescence with 2 more or less paired branches, 2-6 cm. long, occasionally with 1 or 2 additional branches below. Branches erect or slightly spreading, with spikelets short-pedicelled in 2 rows on either side of a straight, broadly triangular rachis. Spikelets plump, glabrous, 2.6-4.0 mm. long, narrowly elliptic or ovate, acute at apex.

GENERAL DISTRIBUTION: North Carolina to Florida and Texas, and south through the Antilles, Central America and South America to Argentina; also in the Old World tropics.

DISTRIBUTION IN LESSER ANTILLES: Antigua, Guadeloupe, Marie Galante, Martinique, St. Lucia, St. Vincent, Barbados.

HABITAT: On coastal sands and along brackish bays.

6. *Paspalum distichum* L., Syst. Nat. ed. 10. 2: 855. 1759.

Type: No location indicated; specimen presumably from *Browne*.

Syn.: *Digitaria paspalodes* Michx., Fl. Bor.-Amer. 1: 46. 1803.

Paspalum paspalodes (Michx.) Scribn. in Mem. Torrey Bot. Club 5: 29. 1894.

Perennial with culms mostly 8–60 cm. tall from an extensive system of long, slender rhizomes. Lower nodes commonly hispid (on the sheath base), the sheaths glabrous above or with stiff hairs on the margins and in small tufts on either side of the collar. Ligule a short, irregularly dissected membrane. Blades flat, mostly 3–12 cm. long and 2–6 mm. broad. Inflorescence with 2 more or less paired branches at culm apex, occasionally 1 or 2 additional branches irregularly developed below. Branches commonly 1.5–6.0 cm. long, occasionally longer, erect and slightly incurved or less frequently spreading, with 2 rows of spikelets on a broad rachis, the rows separated by a membranous ridge. Spikelets 2.5–3.5 mm. long, narrowly ovate or elliptic, acute at apex. First glume absent or irregularly developed, when present usually narrow and pointed, occasionally over half as long as spikelet. Second glume and occasionally the lemma of lower floret sparsely strigose with appressed hairs.

GENERAL DISTRIBUTION: Widespread in the warmer regions of the world, distributed throughout the Antilles.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Grenada.

HABITAT: In moist soil of marshes, stream and lake shores, and ditches, rarely in saline areas.

The species name *Paspalum distichum* recently has been the subject of much controversy. Bor (in Fl. Iraq. 9: 494. 1968) stated that the name had to be changed to the earliest synonym, *P. paspalodes* (Michx.) Scribn. Later he stated that the name *P. vaginatum* Swartz was the proper name for this taxon (in Fl. Iran. 70. 1970). Guédès (in Taxon 25: 512, 513. 1976) noted that one of the several specimens on the Linnaean type sheet is, indeed, *P. distichum* in the conventional interpretation and he proposed to recognize this as a lectotype (or if this had been substituted at a later time by Linnaeus, a neotype). In rebuttal, Fosberg (in Taxon 26: 201, 202. 1977) noted that the faint "Br" below one inflorescence (of *P. vaginatum*) marked this as the holotype. Most recently, Guédès (in Taxon 27: 128, 129. 1978) questioned whether Linnaeus did actually indicate a type, as the type concept was developed after the time of Linnaeus. In the present treatment, the writer is following the reasoning of Guédès and accepting the name *P. distichum* and the lectotype he designated.

7. *Paspalum fimbriatum* H.B.K., Nov. Gen. Sp. 1: 93, pl. 28. 1815.

Type: Columbia, "Novo Granatensis, Rio Magd."

Tufted annual, with weak, often decumbent and branching culms mostly 15-100 cm. tall. Culm nodes appressed-hairy to glabrous. Sheaths laterally compressed, ciliate or variously hairy on back. Ligule a brownish membrane usually 1.5-2.0 mm. long. Blades thin, flat, mostly 5-12 mm. broad and 10-20 cm. long but occasionally much longer, ciliate on margins and glabrous or variously hispid or pilose on the surfaces. Inflorescence of 3-8 erect or spreading-erect branches mostly 2.5-8.0 cm. long. Spikelets in unequally pediceled pairs on either side of a flattened, somewhat winged rachis. Base of rachis usually with a tuft of long, stiff hairs. First glume absent, the second with a broad, firm, irregularly dissected winged margin about 0.5 mm. broad, the wing segments often tipped with short, stiff hairs. Lemma of lower floret usually wingless but occasionally irregularly winged. Body of glume and lower lemma with a strong midnerve, mostly 1.8-2.3 mm. long, the spikelet overall about 3 mm. long.

GENERAL DISTRIBUTION: The Antilles and Trinidad, southern Mexico and south to Panama, Colombia, Venezuela and Brazil.

DISTRIBUTION IN LESSER ANTILLES: Anguilla, St. Martin, Antigua, Saba, St. Eustatius, St. Kitts, Montserrat, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Grenada, Barbados.

HABITAT: A casual weed of roadsides, sandy flats, ditches and waste-places.

8. *Paspalum dilatatum* Poir. in Lam., *Encycl. Méth. Bot.* 5: 35. 1804.

Type: Argentina.

Perennial with culms mostly 40-150 cm. tall, in clumps from a hard, knotty base. Creeping rhizomes and stolons not developed. Sheaths rounded on back or somewhat compressed laterally, the lower ones glabrous or hirsute, the upper ones glabrous. Ligule a brownish membrane usually 1.5-3.0 mm. long. Blades long, firm, flat, up to 40 cm. or more long, 3-12 mm. broad, glabrous or sparsely ciliate at base. Inflorescence branches mostly 2-7(-11), usually 4-8 cm. long. Spikelets in unequally pediceled pairs, usually appearing to be in 4 rows. Branch rachis with long, stiff hairs at base. Spikelets broadly ovate, abruptly narrowing to an acute apex, mostly 2.8-4.0 mm. long. First glume absent. Second glume and lemma of lower floret distinctly 3- to 5-nerved, pubescent on margins with long, silky hairs. Lemma of upper floret light-colored, ovate to suborbicular.

GENERAL DISTRIBUTION: Widely distributed in the warm parts of the world; introduced in the United States as a pasturegrass, with the name Dallisgrass.

DISTRIBUTION IN LESSER ANTILLES: No specific records for the Lesser Antilles.

HABITAT: Grown as a pasturegrass, to be expected as a weed of roadsides, ditches and other disturbed areas.

9. *Paspalum plicatulum* Michx., Fl. Bor.-Amer. 1: 45. 1803.

Type: "Georgia and Florida."

Syn.: *Paspalum undulatum* Poir. in Lam., Encycl. Méth. Bot. 5: 29. 1804. (Type: Puerto Rico.)

Panicum antillense Husnot in Bull. Soc. Linn. Normand. ser. 2. 5: 260. 1871.
(Type: Husnot 76, Guadeloupe.)

Cespitose perennial with culms in small or moderately large clumps from a firm, more or less rhizomatous base. Culms slender, stiffly erect, mostly 50-75(-100) cm. tall, with glabrous or occasionally puberulent nodes. Sheaths keeled, glabrous or less frequently hirsute or pilose. Ligule a brownish membrane 2-3 mm. long. Blades firm, elongate, usually folded at base, mostly 3-7 mm. broad, glabrous or more commonly papillose-hirsute or pilose on adaxial surface near base. Inflorescence branches usually 3-10, with spikelets closely imbricated in pairs along the sides of a flattened, moderately broad, glabrous or scabrous axis 2-9 mm. long. Base of branch glabrous or with a few long, stiff, silvery hairs. Spikelets broadly ovate to obovate, mostly 2.4-2.8 mm. long. First glume absent, the second glume and central portion of lemma of lower floret dark brown, usually minutely puberulent or strigose. Lemma of lower floret thin, occasionally with transverse wrinkles or undulations. Lemma and palea of upper floret dark brown, obtuse at apex.

GENERAL DISTRIBUTION: Southern United States, the Antilles and Mexico, and south to Argentina.

DISTRIBUTION IN LESSER ANTILLES: St. Martin, Antigua, St. Kitts, Nevis, Montserrat, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Grenada, Barbados.

HABITAT: On sandy or clayey soils in open pasturelands or in open woodlands; a highly shade-tolerant species.

10. *Paspalum melanospermum* Desv. in Poir., in Lam., Encycl. Méth. Bot. Suppl. 4: 315. 1816.

Type: Cayenne.

Syn.: *Paspalum olivaceum* Hitchc. & Chase in Contr. U. S. Natl. Herb. 18: 310. 1917. (Type: Duss 3915, Guadeloupe.)

Tufted, glabrous annual with culms mostly 35-75 cm. long. Leaves broad or narrow, the sheaths laterally flattened and keeled, the blades flat, elongate, mostly 4-10 mm. broad. Inflorescence branches 2-7, mostly 1.5-7.0 cm. long, erect-spreading or arcuate and somewhat recurved, with spikelets short-pedicel and paired on either side of the flattened rachis. Rachis glabrous or with a few long hairs at the point of attachment. Spikelets glabrous, broadly obovate, rounded at apex, occasionally minutely mucronate, 1.7-2.0 mm. long. First glume absent, the second glume and lemma of lower floret thin, membranous, light-colored or with a brownish center,

appearing dark brown due to the chestnut-brown-colored lemma and palea of the upper floret.

GENERAL DISTRIBUTION: Southern Mexico to northern South America.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe, Martinique, Grenada.

HABITAT: Low, moist ground, along ditches and ponds, often in disturbed soils.

11. *Paspalum orbiculatum* Poir. in Lam., Encycl. Méth. Bot. 5: 32. 1804.

Type: Puerto Rico.

Syn.: *Paspalum pusillum* Vent. in Flugge, Monogr. Pasp. 100. 1810. (Type: St. Thomas and Puerto Rico.)

Paspalum lenormandi Husnot in Bull. Soc. Linn. Normand. ser. 2. 5: 259. 1871. (Type: Martinique.)

Decumbent perennial with much-branched, creeping, stoloniferous culms freely rooting at the nodes, the erect, floriferous branches 8-60 cm. tall. Lower culm nodes commonly hairy, the upper often glabrous. Sheaths usually ciliate on margins and on either side of collar. Ligule a minute membrane or absent. Blades 1-6 cm. long and 2-7 mm. broad, glabrous or finely hairy. Inflorescence with usually 3-4 spreading or spreading-erect branches, commonly 1.0-2.3 mm. long. Spikelets very short-pedicel, closely placed and solitary, in 2 rows on a narrow but slightly winged rachis. Spikelets glabrous, 1.0-1.2 mm. long, broadly ovate or elliptic to suborbicular, slightly winged on margins. Second glume and lemma of lower floret light-colored, thin and translucent, appearing dark at spikelet maturity due to the dark-reddish or golden-brown color of the lemma and palea of upper floret.

GENERAL DISTRIBUTION: Antilles and southern Mexico to Paraguay.

DISTRIBUTION IN LESSER ANTILLES: Antigua, Guadeloupe, Dominica, Martinique, St. Lucia.

HABITAT: Moist, open ground along streams, ditches, and depressions.

12. *Paspalum bakeri* Hack. in Inf. Est. Centr. Agron. Cuba 1: 410. 1906.

Type: *Baker* 1824, Havana, Cuba.

Densely tufted perennial with numerous, short, narrow, flat or involute basal blades. Culms mostly 20-60 cm. tall, glabrous. Leaves essentially glabrous except for a ring of long hairs just above ligule. Sheaths laterally flattened. Ligule membranous, about 1 mm. long. Blades mostly basal, flat or involute, mostly 3-15 cm. long but occasionally longer, 2-4 mm. broad. Inflorescence with mostly 2-4 stiffly ascending branches 2.5-7.0(-9.0) cm. long. Spikelets in unequally pedicel pairs on a flattened, somewhat triangular rachis. Pedicels stout, scabrous-puberulent. Spikelets glabrous, light-colored, about 2 mm. long, narrowly oblong to obovate, glabrous, abruptly pointed at apex.



FIGURE 36. Poaceae. a-e, *Paspalum urvillei*: a, habit, $\times 0.5$; b, inflorescence, $\times 0.5$; c, d, two views of spikelet, $\times 10$; e, floret, $\times 10$. (Reprinted from Hitchcock, Manual of the grasses of the West Indies, p. 230, fig. 170. 1936.)

GENERAL DISTRIBUTION: The Antilles, most records from Cuba.

DISTRIBUTION IN LESSER ANTILLES: Apparently known from a single collection from Barbuda (*Danforth 1*).

13. *Paspalum molle* Poir. in Lam., Encycl. Méth. Bot. 5: 34. 1804.

Type: Virgin Islands, St. Thomas.

Syn.: *Paspalum portericense* Nash in Bull. Torrey Bot. Club 30: 377. 1903.

Culms slender, erect from a firm, knotty base, mostly 10-60 cm. tall. Culm nodes glabrous. Sheaths glabrous or sparsely appressed-pubescent on margins near apex. Ligule a thin membrane about 0.5 mm. long. Blades thin, usually flat but occasionally involute, mostly 6-15 cm. long and 2-7 mm. broad, gradually tapering below to a narrow base and above to slender tip, often with a few long hairs above the ligule and on the margins. Inflorescence branches 1-5, slender and weak, mostly 1.5-7.0 cm. long. Spikelets mostly paired on a narrow, flattened rachis, on pedicels 1.0-1.5 mm. long. Spikelets narrowly obovate or oblong, light-colored, 1.6-1.8 mm. long, acute at apex. First glume absent. Second glume and lemma about equal, minutely puberulent.

GENERAL DISTRIBUTION: Antilles to Venezuela and Brazil.

DISTRIBUTION IN LESSER ANTILLES: Antigua, *Box 93* (US); Guadeloupe, *Bertero* (MO); Dominica, *Hodge 205* (GH).

HABITAT: On grassy slopes and ridges.

14. *Paspalum decumbens* Sw., Prodr. 22. 1788.

Type: Jamaica.

Syn.: *Panicum decumbens* (Sw.) Roem. & Schult., Syst. Veg. 2: 429. 1817.

Perennial with decumbent or creeping culms, these often rooting at the lower nodes. Erect culms or branches 10-60 cm. tall, branching freely at the lower nodes. Culm nodes bearded. Sheaths densely ciliate on margins, usually glabrous on back. Ligule a minute, brownish membrane, with a ring of long hairs above. Blades lanceolate, 5-12 mm. broad, hairy, the lower ones often densely so. Inflorescence a raceme 1.0-3.5 cm. long, occasionally a panicle with two branches, the culms producing inflorescences at all the upper nodes in age. Spikelets unequally short-pedicel on a narrow, flattened rachis. Spikelets glabrous, broadly obovate, the tip rounded or abruptly short-pointed from a rounded tip. First glume broad, rounded or pointed, uniformly 0.2-0.4 mm. long. Lemma of upper floret rugose and not shiny, $\frac{1}{3}$ to nearly $\frac{1}{2}$ longer than the rounded second glume at maturity.

GENERAL DISTRIBUTION: Guatemala to Brazil and Bolivia.

DISTRIBUTION IN LESSER ANTILLES: Known only from Guadeloupe (*Questel* 4160 and 5098 (US)).

HABITAT: In weedy habitats at lower elevations.

15. *Paspalum nutans* Lam., Tabl. Encycl. Méth. Bot. 1: 175. 1791.

Type: "Ex Amer. merid. Communic. D. Richard."

Syn.: *Paspalum lloydia* Nash, N. Am. Fl. 17: 178. 1913. (Type: *Lloyd* 590, Dominica.)

Tufted perennial with decumbent-erect culms or the culms prostrate-spreading at the base. Culms or culm branches mostly 25-90 cm. tall, the internodes glabrous, the nodes glabrous or hairy. Sheaths ciliate on margins, often hairy on both sides of collar. Ligule a brownish membrane 1-2 mm. long, often with a thin row of long stiff hairs immediately above, on base of blade. Blades broad and rounded at base or tapering from middle to both ends, typically 5-12(-15) mm. broad, scabrous or ciliate and often crimped on margins, usually hispid or pilose on one or both surfaces, occasionally nearly completely glabrous. Inflorescence a slightly curved, unilateral spicate raceme or of 2-4 (rarely 5) spicate branches mostly 1-7 cm. long. Spikelets closely placed in pairs on either side of a narrow, triangular rachis, both members of the pair on short, scabrous or pubescent pedicels. Spikelets 1.8-2.2 mm. long, broadly elliptic or obovate. First glume typically absent, occasionally developed on a few spikelets. Second glume and lemma of lower floret light-colored, glabrous or minutely puberulent, the first glume usually slightly shorter than the lemma. Lemma and palea of upper floret smooth or minutely alveolate, light-colored.

GENERAL DISTRIBUTION: The Antilles, Central America and northern South America.

DISTRIBUTION IN LESSER ANTILLES: St. Kitts, Dominica, Martinique, St. Lucia, St. Vincent, Grenada.

HABITAT: Moist slopes, often in and along forested land, at elevations to 900 meters.

16. *Paspalum setaceum* Michx. var. *ciliatifolium* (Michx.) Vasey in Contr. U. S. Natl. Herb. 3: 17. 1892.

Basionym: *Paspalum ciliatifolium* Michx., Fl. Bor.-Amer. 1: 44. 1803.

Type: *Michaux*, Carolina.

Syn.: *Paspalum debile* Muhl., Cat. Pl. 8. 1813, Desc. Gram. 91. 1817, non *P. debile* Michx., 1803. (Type: Carolina.)

Paspalum propinquum Nash in Bull. N. Y. Bot. Gard. 1: 291. 1899. (Type: *Nash* 1427, Eustis, Lake Co., Florida (NY).)

Tufted perennial with erect to spreading culms 30-80 cm. tall from a firm, often knotty base. Ligule a minute membrane, often with long, white

hairs immediately above. Blades dark green, typically broadly rounded at base, 3-16 mm. broad, glabrous or nearly so. Inflorescence a slender raceme or a panicle with 2(rarely 3) branches. Spikelets unequally paired on a broad, somewhat winged rachis. Spikelets 1.7-2.3 mm. long, broadly elliptic, rounded or slightly pointed at apex. First glume absent, second glume and usually lemma of lower floret puberulent, the hairs often minutely gland-tipped.

GENERAL DISTRIBUTION: Eastern half of the United States, Bermuda and the Antilles, eastern Mexico through Central America.

DISTRIBUTION IN LESSER ANTILLES: Antigua, St. Vincent, St. Lucia, Barbados, Grenada.

HABITAT: Occasional in sandy soil near the coast.

17. *Paspalum pleostachyum* Doell in Mart., Fl. Bras. 2(2): 58. 1877.

Type: Brazil.

Syn.: *Paspalum secans* Hitchc. & Chase in Contr. U. S. Natl. Herb. 18: 319. 1917.

(Type: Chase 6174, Puerto Rico.)

Strong perennial with culms 50-150 cm. or more tall, often in large clumps. Sheaths commonly longer than the internodes, ciliate on upper margins, often with long hairs on collar and villous on upper portion of sheath. Ligule 1.0-1.5 mm. long, with a dense fringe of long hairs immediately above. Blades narrow, elongate, flat or involute, 5-10 mm. broad, 20-100 cm. or more long, often pilose on the adaxial surface and occasionally strongly hairy on both surfaces. Inflorescence branches spreading-erect, commonly 4-12 but occasionally up to 19, mostly 7-15 cm. long. Spikelets mostly short-pedicel and paired on a narrow rachis but often appearing single by abortion of one member of the pair. Spikelets 2.2-2.7 mm. long, narrowly obovate or oblong, glabrous or obscurely puberulent, light-colored and often purple-tinged. First glume absent, the second as long as spikelet and often slightly apiculate at apex.

GENERAL DISTRIBUTION: Antilles and south to Brazil.

DISTRIBUTION IN LESSER ANTILLES: Barbuda, Antigua, Guadeloupe, Grenada.

HABITAT: Grasslands and savannas near the coast. John S. Beard referred to this as "cow-grass," stating that it is the dominant grass in Barbuda savannas.

18. *Paspalum laxum* Lam., Tabl. Encycl. Méth. Bot. 1: 176. 1791.

Type: D. Richard, St. Croix (?).

Syn.: *Paspalum glabrum* Poir. in Lam., Encycl. Méth. Bot. 5: 30. 1804. (Type: Puerto Rico.)

Paspalum rhizomatosum Steud., Syn. Pl. Glum. 1: 17. 1854. (Type: Duchassaing, Guadeloupe.)

Paspalum kleopodum Steud., Syn. Pl. Glum. 1: 18. 1854. (Type: *Duchassaing*, Guadeloupe.)

Paspalum helleri Nash in Bull. Torrey Bot. Club 30: 376. 1903. (Type: Puerto Rico.)

Tufted perennial with slender culms commonly 30-90(-110) cm. tall. Culms and leaves essentially glabrous, the sheaths often ciliate at the apex. Ligule 1.0-1.5 mm. long. Blades elongate, flat or, in the dry season, involute, commonly 15-30(-50) cm. long, 3-8 mm. broad. Inflorescence with a slender main axis and slender branches, these commonly 2-5(-14), arcuate-spreading, usually 3-9 cm. long but occasionally longer. Rachis narrow, flattened, with a few long hairs at base, the spikelets in pairs on short, puberulent pedicels. Spikelets narrowly elliptic or obovate, broadly pointed, 1.6-2.0 mm. long. First glume absent, the second light-colored, often speckled with brown, densely to obscurely puberulent. Upper floret 1.6-1.7 mm. long, rounded or slightly pointed at apex.

GENERAL DISTRIBUTION: Endemic to the Antilles.

DISTRIBUTION IN LESSER ANTILLES: Anguilla, Barbuda, Antigua, St. Kitts, Nevis, Redonda, Guadeloupe, La Desirade, Dominica, Martinique, St. Lucia, Grenada.

HABITAT: Sandy slopes and ravines.

19. *Paspalum nesiotes* Chase in Contr. U. S. Natl. Herb. 28: 117, f. 67. 1929.

Type: *Hitchcock 16471*, St. Lucia (us).

Perennial with tufted culms 45-120 cm. tall. Sheaths keeled towards the apex, glabrous. Ligule a membrane 2-3 mm. long. Blades glabrous or minutely hispid on adaxial surface, flat or folded, mostly 25-50 cm. long and 6-11 mm. broad, with uniform width for most of the length. Sheath and blade about equally wide at collar, the junction inconspicuous. Inflorescence with 5-14 erect-spreading branches, these 4-10 cm. long. Spikelets in pairs on slender, scabrous pedicels, in irregular clusters. Spikelets about 2 mm. long, broadly elliptic, glabrous, light brown or slightly purple-tinged. Lemma of upper floret broadly elliptic or obovate, rounded at apex.

GENERAL DISTRIBUTION: Endemic to the Lesser Antilles.

DISTRIBUTION IN LESSER ANTILLES: Known only from Martinique (*Duss 548 1/2* (us)) and St. Lucia (*Hitchcock 16471*).

HABITAT: Grassy slopes.

20. *Paspalum arundinaceum* Poir. in Lam., Encycl. Méth. Bot. Suppl. 4: 310. 1816.

Type: Cayenne.

Robust perennial with culms to 2 m. or more tall, usually in dense clumps. Blades firm, elongate, flat or involute, 5-10 mm. broad and often

1 m. or more long. Panicles large, well-exserted, with (9-)12-18(-22) thick branches, these mostly 10-20 cm. long. Branch rachis glabrous or scabrous, 1 mm. or slightly more broad. Spikelets glabrous, broadly obovate-elliptic, rather densely congested on the stiffly spreading branches, mostly 2.3-2.8 mm. long. First glume occasionally developed.

GENERAL DISTRIBUTION: Antilles, Central America and French Guiana.

DISTRIBUTION IN LESSER ANTILLES: Antigua and the Grenadines. Reports from several other islands are yet to be confirmed.

HABITAT: Marshes and low, moist, open ground at low elevations.

Paspalum arundinaceum and *P. pleostachyum* (including *P. secans*) probably belong to a single species complex, in which case *P. arundinaceum* is the oldest valid name. Typically *P. arundinaceum* appears to be a larger, coarser plant with more numerous and "thicker" inflorescence branches and slightly larger spikelets. Hitchcock (Man. Grasses W. I. 232. 1936) referred specimens from Cuba and Jamaica to *P. secans* which earlier (Hitchcock & Chase, 1917) he had treated as *P. arundinaceum*, and which in the present interpretation would be referred to *P. pleostachyum*.

21. *Paspalum virgatum* L., Syst. Nat. ed. 10. 2: 855. 1759.

Type: Jamaica.

Syn.: *Paspalum virgatum* L. var. *jacquinianus* Flugge, Monogr. Pasp. 190. 1810. (Type: "Caribbean Islands.")

Paspalum virgatum L. var. *stramineum* Griseb., Fl. Br. W. Ind. 543. 1864. (Type: "Jamaica and Antigua.")

Robust perennial with stiffly erect or basally curved, glabrous culms 1-2 m. tall, often in large clumps. Lower sheaths thin, more or less papery, reticulate or alveolate on drying, the upper sheaths rounded or somewhat keeled, ciliate on upper margins or only scabrous. Blades long, firm, flat, mostly 1.0-2.5(rarely to 3.0) cm. broad, often hirsute with long hairs on adaxial surface toward base. Panicle with a slender main axis and erect or drooping branches. Panicle branches relatively thick and with closely-placed, paired spikelets, mostly 8-16(-20) cm. long, with spikelets forming 4 rows. Spikelets rather long-pedicelated, broadly obovate or elliptic, chestnut-brown, mostly about 2.5 mm. long but varying to 3 mm. long. Glume densely to sparsely short-hairy, apiculate at apex. Lemma of lower floret puberulent to glabrous, often crisped along the margins and apiculate at apex.

GENERAL DISTRIBUTION: Antilles, southern United States and south through Mexico and Central America to Brazil.

DISTRIBUTION IN LESSER ANTILLES: St. Martin, Antigua, St. Kitts, Montserrat, Guadeloupe, Marie Galante, Dominica, Martinique, St. Lucia, St. Vincent, the Grenadines, Grenada, Barbados.

HABITAT: Open or partially shaded sites in marshy meadows and swamps, and along rivers, at elevations to 700 meters.

22. *Paspalum paniculatum* L., Syst. Nat. ed. 10. 2: 855. 1759.

Type: Jamaica.

Syn.: *Paspalum hemisphericum* Poir. in Lam., Encycl. Méth. Bot. 5: 31. 1804. (Type: Puerto Rico.)

Paspalum strictum Pers., Syn. Pl. 1: 86. 1805. (Type: Dominican Republic, Santo Domingo.)

Coarse perennial with culms in clumps and often rooting at the lower nodes. Culms commonly 50-100 cm. tall but occasionally up to 2 m. or more. Nodes from sparsely hispid to densely hirsute. Sheaths laterally compressed and keeled, variously pilose or hispid with papilla-based hairs to nearly glabrous. Ligule 2-3 mm. long. Blades commonly 10-30 cm. long and 10-20 mm. broad, occasionally longer and broader, from coarsely hispid on both surfaces to scabrous or glabrous. Panicle with numerous (10-60) usually closely placed branches on an angular axis, the lower branches 4-12 cm. long, the upper much-reduced. Branch rachis narrow, glabrous except for a few long hairs at base, with closely placed pairs of short-pediceled spikelets. Spikelets broadly elliptic or suborbicular, 1.2-1.5 mm. long, the glume and sometimes the margin of lemma of lower floret finely pubescent with soft hairs, light-brown, greenish or purplish, rounded or slightly pointed at apex.

GENERAL DISTRIBUTION: Throughout the warmer parts of the world, in Asia, Africa, Australia and islands of the Pacific Ocean as well as the Antilles, southern Mexico, Central America and South America.

DISTRIBUTION IN LESSER ANTILLES: Anguilla, St. Martin, Saba, St. Kitts, Guadeloupe, Dominica, Martinique, St. Lucia, Grenada.

HABITAT: Moist, open ground, often roadways, field borders and other areas of disturbance.

23. *Paspalum fasciculatum* Willd. in Flugge, Monogr. Pasp. 69. 1810.

Type: Brazil.

Coarse perennial with culms to 2.5 m. tall from a stoloniferous base. Stolons extensive, branched, as much as 5 m. long. Culm nodes glabrous or bearded. Sheaths broad, usually densely ciliate on margins, occasionally pilose on back near apex. Ligule short and firm, to 1 mm. long, with a dense ring of hairs immediately above on blade. Blades long, flat, mostly 1.0-3.5 cm. broad but narrower on reduced leaves, the surfaces from glabrous to pilose. Panicles commonly with 10-25 branches, these mostly 7-17 cm. long, laxly spreading or drooping. Branch rachis 1.0-1.5 mm. broad, the margins scabrous and often with a few long hairs, especially at base. Spikelets borne singly on short, flat, scabrous pedicels. Spikelets purplish,

4-5 mm. long, narrowly oblong. Glume and lemma of lower floret sparsely to strongly ciliate on margins but otherwise glabrous, narrowly acute to acuminate at apex, the lemma thin and usually wrinkled on back.

GENERAL DISTRIBUTION: Antilles and southern Mexico to Ecuador and Argentina.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe, St. Lucia.

HABITAT: In moist or wet, open soil along streams, lakes and marshy places.

24. *Paspalum millegrana* Schrad. in Schult., Mant. 2: 175. 1824.

Type: Brazil.

Syn.: *Paspalum underwoodii* Nash in Bull. Torrey Bot. Club 30: 375. 1903. (Type: *Underwood & Griggs 149*, Puerto Rico.)

Coarse, essentially glabrous perennial, with culms up to 2 m. tall. Panicle branches commonly 10-30, mostly 5-15 cm. long. Spikelets glabrous, greenish or purplish, suborbicular, 2.0-2.4 mm. long. Plants similar to *P. virgatum* except in the key characters.

GENERAL DISTRIBUTION: Antilles and Central America to Brazil.

DISTRIBUTION IN LESSER ANTILLES: Antigua, Guadeloupe, Dominica, St. Lucia, Barbados.

HABITAT: Open, marshy or swampy areas.

25. *Paspalum densum* Poir. in Lam., Encycl. Méth. Bot. 5: 32. 1804.

Type: Puerto Rico.

Robust perennial with culms mostly 1-2 m. tall, usually in large clumps. Culm nodes glabrous to hirsute. Base of plant leafy, with numerous broad, overlapping sheaths to 40 cm. long, these light-colored, thin or spongy, reticulate on drying, compressed above, gradually tapering into the folded blade base. Ligule a membrane 1.5-3.0 mm. long. Blades commonly 50-80 cm. long and 1-2 cm. broad, typically folded to above middle, sharply serrate on margins, pilose or hispid above ligule. Panicle with a long, thick axis bearing usually 50-100 or more branches, these erect-spreading, the lowermost usually 6-9 cm. long, the upper ones shorter and congested. Spikelets in pairs, densely crowded on a rachis mostly 1.2-1.5 mm. broad, the rachis with long white hairs on margins and at base of pedicels. Spikelets glabrous, suborbicular, 1.9-2.2 mm. long, obtuse at apex, tan or brownish, occasionally purple-tinged.

GENERAL DISTRIBUTION: Antilles and Panama to Brazil.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe, St. Martin, St. Vincent.

HABITAT: Marshy or wet land along swales, rivers and low pastures.

26. *Paspalum urvillei* Steud., Syn. Pl. Glum. 1: 24. 1854.

Type: ? Brazil.

Syn.: *Paspalum vaseyanum* Scribn. in U. S. D. A. Div. Agrost. Bull. 17: 32, f. 328. 1899. (Type: Texas.)

Coarse perennial with stiffly erect culms 1-2 m. tall, in clumps from a firm or hard, subrhizomatous base. Lower sheaths usually hirsute or villous with long hairs, the upper sheaths glabrous. Ligule well developed, 3-5 mm. long. Blades long, firm, flat, mostly 4-15 mm. broad, glabrous except for a tuft of long white hairs immediately above ligule. Panicle usually with 8-30 stiffly erect branches, these 4-10(-14) cm. long. Spikelets in slender, unequally pediceled pairs, the longer pedicels 1.5-2.0 mm. long. Spikelets light-colored, 2.2-2.7 mm. long, broadly ovate, silky-pubescent especially at base and on margins of glume and lemma of lower floret, abruptly pointed at apex.

GENERAL DISTRIBUTION: Reportedly native to Brazil and Argentina; widely disseminated as a forage grass and now frequent in the southern United States and occasional in the Antilles.

DISTRIBUTION IN LESSER ANTILLES: Martinique, Guadeloupe.

HABITAT: Low, moist pasturelands; in the United States frequent as a weed of roadside ditches and swales.

27. *Paspalum saccharoides* Nees in Trin., Gram. Icon. 1: pl. 107. 1828.

Based on *Saccharum polystachyum* Sw., Prodr. 21. 1788, non *Paspalum polystachyum* R. Br., 1810.

Type: Masson, St. Christopher.

Stout perennial with culms erect or decumbent at base, 1-2 m. tall, often rooting at the lower nodes. Culm nodes glabrous. Lower sheaths short and overlapping, glabrous to densely silky-villous. Ligule a short membrane with a dense row of long, stiff hairs immediately above it on the blade. Blades flat, firm, 8-15 mm. broad, tapering to a slender, acuminate tip, usually finely pilose on adaxial surface and glabrous on abaxial surface. Panicle a purplish flabellate mass of long, slender, irregularly erect-spreading branches mostly 15-20 cm. long, the branches often with a tuft of hairs at base and bare of spikelets for 5-20 mm. from base. Branch rachis narrow, triangular, bearing widely spaced, solitary (unpaired) spikelets on slender, sometimes rather long, pedicels. Spikelets silky-villous, narrowly lanceolate, acuminate, subcordate at base, 2.5-3.0 mm. long. Glume and lemma of lower floret thin, 3-nerved, usually light-brown, sparsely pubescent on back, fringed with silky hairs 3-8 mm. long.

GENERAL DISTRIBUTION: The Antilles and Tobago south to Bolivia.

DISTRIBUTION IN LESSER ANTILLES: St. Kitts, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Grenada.

HABITAT: Grassy or bushy slopes, often in partial shade.

44. HYMENACHNE Beauvois

Hymenachne Beauv., Ess. Agrost. 48, pl. 10, f. 8. 1812. FIGURE 37.

Succulent, stoloniferous perennials of wet, marshy habitats. Culms thick, spongy, widely creeping or floating at base. Ligule membranous. Blades long, broad and flat. Inflorescence a densely flowered, elongate and often spikelike panicle. Spikelets 2-flowered, the upper floret perfect, the lower one staminate or sterile. Disarticulation below the glumes. First glume short, separated from the second by a distinct internode. Second glume and lemma of lower floret larger and longer than lemma of upper (perfect) floret. Lemma and palea of upper floret membranous, thin, the lemma margins not inrolled over the palea.

TYPE SPECIES: *Hymenachne amplexicaulis* (Rudge) Nees, based on *Panicum amplexicaule* Rudge.

Species about eight, in the warmer regions of both hemispheres.

1. **Hymenachne amplexicaulis** (Rudge) Nees, Agrost. Bras. 276. 1829.

Basionym: *Panicum amplexicaule* Rudge, Pl. Guian. 1: 21, pl. 27. 1805.

Type: British Guiana.

Syn.: *Hymenachne myurus* auct. (excl. Grisebach), non Lam., nec H.B.K.

Culms often trailing and stoloniferous at base and rooting at lower nodes, the erect, floriferous shoots to 1 m. or more tall. Lower blades long and broad, typically 2-3 cm. wide, with a cordate base, this usually ciliate with a few coarse hairs. Panicles mostly 15-50 cm. long, spikelike or the lower branches somewhat spreading-erect. Spikelets 3.0-4.5 mm. long. First glume thin, membranous, 1-nerved, scabrous on the nerve, acute, about $\frac{1}{4}$ the length of the spikelet. Second glume 3- or 5-nerved, acuminate, 0.5-1.0 mm. shorter than the acuminate tip of the lower lemma.

GENERAL DISTRIBUTION: In the tropics of both hemispheres.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe, Dominica, Martinique, St. Lucia, Barbados.

HABITAT: Wet, swampy areas, often in shallow water of marshes and lake borders.

45. SACCIOLEPIS Nash

Sacciolepis Nash in Britt., Man. 89. 1901.

FIGURE 38.

Annuals and perennials with thin, flat or loosely involute blades and contracted, usually spikelike panicles of 2-flowered spikelets. Ligule a thin membrane. Spikelets oblong, asymmetrical at base, 2-flowered, disarticulating below glumes. First glume thin, short, acute. Second glume inflated-saccate at base, strongly many-nerved, as long as the spikelet. Lemma of lower floret equalling upper glume and similar in nervation and texture. Lemma of upper floret narrowly elliptical, smooth and shiny, awnless or with a delicate, hairlike awn, much shorter than lower floret.



FIGURE 37. Poaceae. *Hymenachne amplexicaulis*, culm base, blades and inflorescence, $\times 0.5$. (Reprinted from Hitchcock, Manual of the grasses of the West Indies, p. 314, fig. 292. 1936.)

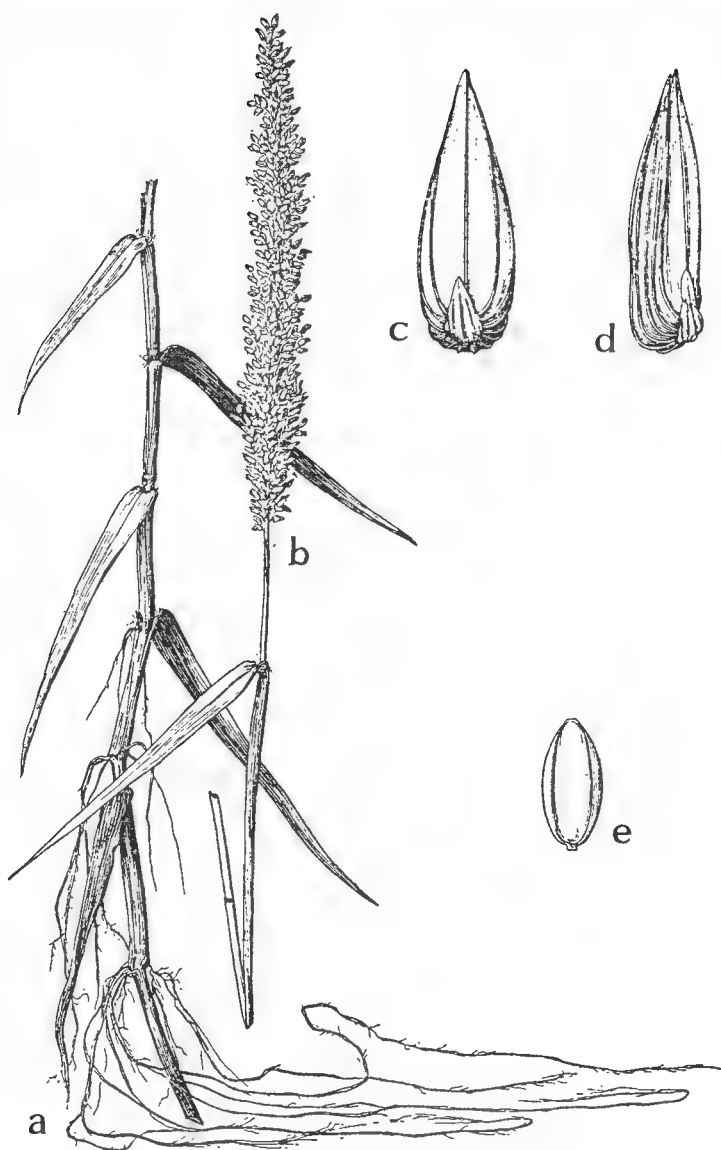


FIGURE 38. Poaceae. a-e, *Sacciolepis striata*: a, culm and blades, $\times 0.5$; b, inflorescence, $\times 0.5$; c, d, two views of spikelet, $\times 10$; e, floret, $\times 10$. (Reprinted from Hitchcock, Manual of the grasses of the West Indies, p. 311, fig. 291. 1936.)

TYPE SPECIES: *Sacciolepis striata* (L.) Nash, based on *Holcus striatus* L.

Species about 30, in the tropics and subtropics of both hemispheres.

1. *Sacciolepis indica* (L.) Chase in Proc. Biol. Soc. Washington 21: 8. 1908.

Basionym: *Aira indica* L., Sp. Pl. 2: Errata, after index. 1753.

Type: India.

Tufted annual with slender, erect or spreading culms mostly 20-70 cm. tall. Ligule a ciliate membrane 0.5-1.0 mm. long. Blades mostly 4-18 cm. long and 2-5 mm. broad, glabrous or variously hairy. Inflorescence spike-like, densely flowered, mostly 1-7 cm. long. Second glume and lower lemma glabrous or coarsely hispid on the sides. Lemma of upper floret smooth and shiny, about 1.5 mm. long.

GENERAL DISTRIBUTION: Tropical Asia, Polynesia, and Australia; introduced in Africa and the Americas.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe, Basse-Terre, *Sastre & Fournet* 2908(A).

HABITAT: Low, marshy places, often in moist ditches and along swales.

46. LASIACIS (Grisebach) Hitchcock

Lasiacis (Griseb.) Hitchc. in Contr. U. S. Natl. Herb. 15: 16. 1910.

FIGURE 39.

Stout perennials with woody, branching, mostly viny culms and flat, often broad blades. Ligules membranous or hairy. Blades broad at base or tapering from the middle to a rather narrow base. Blades mostly acute to acuminate, often broad and more or less falcate, hairy or glabrous. Inflorescence a small to large panicle of awnless, 2-flowered spikelets. Disarticulation below glumes. Spikelets usually broad, gibbous, placed obliquely on their pedicels. First glume short, broad, often somewhat inflated. Second glume and lemma of lower floret broad, chartaceous and shiny, obtuse or apiculate, glabrous or lanate with a tuft of white hairs at tip. Lower floret usually neuter. Upper floret with a bony-indurate, obovoid lemma and a palea of the same texture, these with a tuft of woolly hairs in a slight depression at the apex.

TYPE SPECIES: *Lasiacis divaricata* (L.) Hitchc., based on *Panicum divaricatum* L.

A genus of about 30 species occurring in the American tropics and subtropics.

KEY TO THE SPECIES

1. Ligule a conspicuous brownish, slightly ciliate membrane, at least some ligules 1.5-2.0 mm. long. 1. *L. ligulata*
- 1a. Ligule inconspicuous, rarely as much as 1 mm. long, often densely hairy. . . 2

2. Panicles 5-10 cm. long on the primary branches; blades narrowly lanceolate, firm, mostly less than 1 cm. broad. 2. *L. divaricata* var. *divaricata*
- 2a. Panicles usually 15-25 cm. long on the primary branches; blades, at least some, usually over 1 cm. broad. 3
3. Blades pubescent on both surfaces. 3A. *L. sorghoidea* var. *sorghoidea*
- 3a. Blades glabrous on both surfaces. 4
4. Spikelets 3.5-4.0 mm. long, on flexuous, spreading pedicels. 3B. *L. sorghoidea* var. *patentiflora*
- 4a. Spikelets 4.5-5.0 mm. long, on stiff, appressed pedicels. 4. *L. sloanei*

1. *Lasiacis ligulata* Hitchc. & Chase in Contr. U. S. Natl. Herb. 18: 337. 1917.

Type: *Hitchcock 10007*, Trinidad.

Culms viny, climbing to a height of 4-10 m., with a central cane to 1 cm. in diameter, the branches and branchlets straight, not zigzag. Sheaths short, often overlapping, ciliate on the margins, otherwise glabrous. Ligule a brownish, slightly ciliate membrane, at least some ligules 1.5-2.0 mm. long. Blades 6-12 cm. long and 8-15 mm. broad, lanceolate, acuminate, narrowing at base, short-hairy on one or both surfaces. Panicles mostly 5-10 cm. long, open, few-flowered, the short basal branches usually spreading or reflexed and bearing 5-10 spikelets. Spikelets about 4 mm. long, purplish-black at maturity, the glumes and lemma of lower floret often with a lanate tuft at the apex.

GENERAL DISTRIBUTION: The Antilles, Trinidad, and Tobago, south to Ecuador and Brazil.

DISTRIBUTION IN LESSER ANTILLES: St. Vincent, *Cooley 8182* (G, annotated by Davidse); also a confirmed report from Dominica.

HABITAT: Trailing on shrubs and low tree branches in and along the forest.

2. *Lasiacis divaricata* (L.) Hitchc. var. *divaricata* in Contr. U. S. Natl. Herb. 15: 16. 1910.

Basionym: *Panicum divaricatum* L., Syst. Nat. ed. 10. 2: 871. 1759.

Type: Jamaica.

Syn.: *Panicum chauvinii* Steud., Syn. Pl. Glum. 1: 68. 1854.

Lasiacis harrisii Nash in Torreyia 13: 274. 1913. (Type: *Marble 222*, Jamaica.)

Perennial with slender branches to 5 m. long, climbing and trailing over bushes and low tree branches, the secondary shoots usually strongly divaricate or zigzag. Sheaths ciliate on upper margins and often on collar and throat, occasionally pilose on back. Ligule minute, inconspicuous. Blades glabrous, narrowly lanceolate, 5-12 cm. long, 4-10(-15) mm. broad, gradually narrowing above to an acuminate apex, often deciduous in age. Panicles few-flowered, mostly 4-12 cm. long, on appressed or spreading branches usually not more than 1.5 cm. long. Spikelets about 4 mm. long.



FIGURE 39. Poaceae. a-c, *Lasiacis divaricata*: a, habit, $\times 0.5$; b, spikelet, $\times 10$; c, floret, $\times 10$. (Reprinted from Hitchcock, Manual of the grasses of the United States, p. 707, fig. 1080. 1951.)

GENERAL DISTRIBUTION: Southern Florida, the Antilles, Central America and South America.

DISTRIBUTION IN LESSER ANTILLES: St. Martin, Antigua, Saba, St. Eustatius, St. Kitts, Montserrat, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Grenada, Barbados.

HABITAT: Among and on shrubs and low trees.

3A. *Lasiacis sorghoidea* (Desv.) Hitchc. & Chase var. *sorghoidea* in Contr. U. S. Natl. Herb. 18: 338. 1917.

Basionym: *Panicum sorghoideum* Desv. ex Hamilt., Prodr. 10. 1825.

Type: Puerto Rico.

Syn.: *Panicum lanatum* Sw., Prodr. 24. 1788, non Rottb., 1776. (Type: Jamaica.)

Panicum martinicense Griseb., Fl. Br. W. Ind. 552. 1864. (Type: Sieber 29, Martinique (isolectotype, M).)

Robust perennial with a glabrous or pubescent central culm reaching 5-7 m. in height, with lateral, spreading branches to 1 m. or more long. Tips of branches slender, trailing, or the branchlets fascicled on the main culm. Sheaths ciliate-pubescent on margins and hairy on collar, occasionally pubescent on back. Ligule minute, inconspicuous. Blades lanceolate, those of the main culms and branches to 20 cm. long and 3 cm. broad, those of the floriferous branches mostly 8-12 cm. long and up to 15 mm. broad. Blades velvety, short-pilose or puberulent, often glabrate in age. Panicles mostly 10-25 cm. long, with widely spaced branches mostly 3-12 cm. broad, these typically widely spreading or reflexed at maturity and with a few spreading secondary branches. Spikelets 4-5 mm. long, the glumes and lower lemma with tufts of hair at the apex.

GENERAL DISTRIBUTION: Mexico and the Antilles to Argentina and Bolivia.

DISTRIBUTION IN LESSER ANTILLES: Antigua, St. Kitts, Montserrat, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Grenada, Barbados.

HABITAT: Climbing and trailing on shrubs and low trees.

3B. *Lasiacis sorghoidea* (Desv.) Hitchc. & Chase var. *patentiflora* (Hitchc. & Chase) Davidse in Ann. Missouri Bot. Gard. 64: 375. 1977.

Basionym: *Lasiacis patentiflora* Hitchc. & Chase in Contr. U. S. Natl. Herb. 18: 338. 1917.

Type: Hitchcock 10268, Tobago.

Similar to *L. sorghoidea* var. *sorghoidea* but blades glabrous and spikelets 3.5-4.0 mm. long.

GENERAL DISTRIBUTION: Antilles and Central America to Venezuela.

DISTRIBUTION IN LESSER ANTILLES: Dominica, St. Vincent, the Grenadines, Grenada, Barbados.

HABITAT: Shaded banks and cliffs, borders of thickets and woods.

4. *Lasiacis sloanei* (Griseb.) Hitchc. in Bot. Gaz. 51: 302. 1911.

Basionym: *Panicum sloanei* Griseb., Fl. Br. W. Ind. 551. 1864.

Type: Jamaica.

Syn.: *Panicum latifolium* Hamilt., Prodr. 10. 1825, non *P. latifolium* L.

Similar to *L. sorghoidea* var. *sorghoidea* in general habit but blades glabrous and usually broader.

GENERAL DISTRIBUTION: The Antilles to Central and South America.

DISTRIBUTION IN LESSER ANTILLES: Antigua, Martinique, Grenada.

HABITAT: Brushy or forested slopes, usually in deep shade.

47. *ICHNANTHUS* Beauvois

Ichnanthus Beauv., Ess. Agrost. 56, pl. 12, f. 1. 1812.

Perennials and a few annuals, mostly decumbent at base and often with prostrate, trailing culms that root at the nodes. Culms usually with many nodes and short internodes. Sheaths typically short, usually only $\frac{1}{2}$ – $\frac{2}{3}$ as long as the culm internode. Blades mostly short and broad, cordate at the base in some species and with a constricted petiolelike base in others. Inflorescence a small to rather large panicle with stiffly spreading-erect primary branches, these simple or with short, few-flowered secondary branches. Spikelets usually in unequally pediceled pairs, disarticulating below the glumes. Spikelets 2-flowered, awnless, with rather widely spaced glumes and florets, the upper floret perfect, the lower floret staminate or neuter. First glume 1- to 3-nerved, often $\frac{1}{2}$ or more the length of the spikelet. Second glume 5- to 7-nerved, usually attenuate or acuminate and longer than the lower lemma. Palea of lower floret hyaline but well developed. Upper floret slightly stalked, the lemma and palea thin but firm, smooth, the lemma with winged appendages or glandular scars at base, flat or inrolled on margins and rounded at apex, usually considerably shorter than the second glume and lower lemma.

TYPE SPECIES: *Ichnanthus panicoides* Beauv.

About 60 species, mainly in tropical America, a few in Asia and Australia.

KEY TO THE SPECIES

1. Lower glume about as long as lemma of lower floret and nearly as long as spikelet, with an attenuate, subsetaceous tip; blades sparsely hispid..... 1. *I. nemorosus*
- 1a. Lower glumes $\frac{1}{3}$ – $\frac{2}{3}$ as long as lemma of lower floret, usually with an acute or acuminate tip; blades glabrous. 2. *I. pallens*

1. ***Ichnanthus nemorosus*** (Sw.) Doell in Mart., Fl. Bras. 2(2): 289. 1877.

Basionym: *Panicum nemorosum* Sw., Prodr. 22. 1788.

Type: Jamaica.

Weak perennial or long-lived annual with slender, trailing culms, numerous nodes and short internodes, and short, broad, thin, often falcate blades. Erect, floriferous branches mostly 15–40 cm. tall. Sheaths densely pubescent on margins and often at base, variously glabrous to puberulent or hairy on back. Blades mostly 4–8 cm. long, occasionally longer, and 8–30 mm. broad, typically sparsely hispid on one or both surfaces. Panicles small and few-flowered, 2.3–5.5 mm. long, glabrous or occasionally with a few long hairs on the margins of the glumes. Lower floret of spikelet staminate.

KEY TO THE VARIETIES

1. Spikelets 2.3–4 mm. long; upper floret 1.5–2.0(–2.2) mm. long. 1A. *I. nemorosus* var. *nemorosus*
1a. Spikelets 4.0–5.5 mm. long; upper floret 2.1–2.6 mm. long. 1B. *I. nemorosus* var. *swartzii*

1A. ***Ichnanthus nemorosus*** (Sw.) Doell var. ***nemorosus***.

Ligule 0.5–1.2 mm. long. Sheaths pilose or glabrescent on back. Spikelets 2.3–4.0 mm. long, the upper floret 1.5–2.0(–2.2) mm. long. Stamens of lower floret 0.8–1.5 mm. long, those of upper floret 1.0–1.4 mm. long. Caryopsis 1.0–1.5 mm. long.

GENERAL DISTRIBUTION: Antilles and Trinidad, Mexico and Central America.

DISTRIBUTION IN LESSER ANTILLES: St. Kitts, Martinique.

HABITAT: Moist banks and humid forest slopes.

1B. ***Ichnanthus nemorosus*** (Sw.) Doell var. ***swartzii*** K. E. Rogers in Phytologia 22(2): 100, 101. 1971.

Type: *Leonard 4858*, Petionville, Haiti (holotype, us).

Ligule 0.7–1.8 mm. long. Sheaths usually glabrous on back. Spikelets 4.0–5.5 mm. long, the upper floret 2.1–2.6 mm. long. Stamens of lower floret 1.3–1.8 mm. long, those of upper floret 1.3–1.8 mm. long. Caryopsis 1.5–1.7 mm. long.

GENERAL DISTRIBUTION: The Antilles and Trinidad.

DISTRIBUTION IN LESSER ANTILLES: St. Kitts, Nevis, Montserrat, Martinique, St. Vincent, Grenada.

HABITAT: Moist, shaded forest habitats.

2. *Ichnananthus pallens* (Sw.) Munro in Benth., Fl. Hongkong. 414. 1861.

Basionym: *Panicum pallens* Sw., Prodr. 23. 1788.

Type: Jamaica.

Perennial (or annual ?) with long, trailing culms, short sheaths and spreading culms. Flowering shoots weakly erect, mostly 25–80 cm. tall. Sheaths mostly glabrous but usually with puberulent margins and often with hairs at base. Ligule a truncate membrane usually less than 1 mm. long. Blades typically 6–11 cm. long and 10–25 mm. broad but often smaller, lanceolate, usually somewhat falcate, glabrous. Panicles mostly 5–10 cm. long, the branches contracted or rather open, the nodes often puberulent. Spikelets 3–4 mm. long, the shiny upper floret mostly 2 mm. or less long.

GENERAL DISTRIBUTION: The Antilles and Trinidad.

DISTRIBUTION IN LESSER ANTILLES: St. Martin, Antigua, Saba, St. Kitts, Montserrat, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Grenada, Barbados.

HABITAT: Moist banks and in tropical forest, from low to medium elevations, often forming mats on the forest floor.

48. *SETARIA* Beauvois

Setaria Beauv., Ess. Agrost. 51, pl. 13, f. 3. 1812, nom. cons.

Annuals and perennials, a few rhizomatous or stoloniferous. Ligule a short membrane fringed with hairs. Leaf blades flat, folded, involute, or broad and plicate, occasionally petiolelike at base. Inflorescence a narrow, often bristly panicle, usually dense and spicate, with sessile or subsessile spikelets. Some or all spikelets subtended by 1–several persistent bristles (reduced branches or pedicels), the spikelets disarticulating above the persistent bristles. Spikelets 2-flowered, the lower floret staminate or neuter, the upper floret perfect. First glume short, the second glume equal to or shorter than the lemma of lower floret. Lemma and palea of upper floret firm, rounded at apex and inrolled on margins, usually finely to coarsely transverse-rugose.

TYPE SPECIES: *Setaria viridis* (L.) Beauv., based on *Panicum viride* L. (typ. cons.).

A genus of about 125 species, mostly in Africa but some in the warmer parts of all the continents. The following treatment is based primarily on J. M. Rominger, Taxonomy of *Setaria* (Gramineae) in North America (Illinois Biol. Monogr. no. 29: viii & 132 pp. University of Illinois Press, Urbana. 1962).

KEY TO THE SPECIES

1. Bristles solitary below the uppermost spikelet of each branch, absent below the lower spikelets; blades 1–3 mm. broad. 1. *S. utowanaea*

- 1a. Bristles 1-several below the spikelets or if absent below the lower spikelets of each branch then the blades 5 mm. or more broad. 2
2. Blades broad and usually plicate; bristles below only part of the spikelets. 3
- 2a. Blades not plicate; bristles below all spikelets. 5
3. Plants perennial; primary panicle branches mostly 6-25 cm. long; leaf blades 2-10 mm. broad. 4
- 3a. Plants annual; primary panicle branches 3-12 cm. long; leaf blades to 2 cm. or more broad. 4. *S. barbata*
4. Tip of lower lemma exceeding upper lemma by as much as 1 mm.; branches of panicle mostly 4-10 cm. in length; bristles mostly 4-8 mm. long; leaf blades to 6 cm. broad. 2. *S. palmifolia*
- 4a. Tip of lower lemma and tip of upper lemma about equal; branches of panicle to 25 cm. long; bristles as much as 15 mm. long; leaf blades to as much as 10 cm. broad. 3. *S. paniculifera*
5. Bristles 4-12 below each spikelet; inflorescence spike-like. 6
- 5a. Bristles 1-3 below each spikelet. 7
6. Plants perennial, with hard culm bases and usually short knotty rhizomes. ... 5. *S. geniculata*
- 6a. Plants annual, the culm bases not hard. 6. *S. glauca*
7. Bristles partially or completely retrorsely scabrous. 8
- 7a. Bristles antrorsely scabrous only. 9
8. Bristles retrorsely scabrous only; panicle branches verticillate; plants annual. 7. *S. verticillata*
- 8a. Bristles both retrorsely and antrorsely barbed; panicle branches not verticillate; plants perennial. 8. *S. tenax*
9. Panicle densely flowered, spicate, the main axis usually not readily visible except below; lemma and palea of upper floret smooth and shiny. 10
- 9a. Panicle loosely flowered, the main axis readily visible for most or all of its length; lemma and palea of upper floret finely but distinctly transverse-rugose. 11
10. Spikelets 2 mm. long; palea of lower floret broad, as long as the lemma. 9. *S. magna*
- 10a. Spikelets 3 mm. long; palea of lower floret $\frac{1}{2}$ as long as the lemma. 10. *S. italica*
11. Leaf blades narrow, usually less than 5 mm. broad. 11. *S. rariflora*
- 11a. Leaf blades 6-20 mm. or more broad. 12
12. Leaf blades glabrous or pubescent, seldom more than 1 cm. broad. 12A. *S. setosa* var. *setosa*
- 12a. Leaf blades glabrous or scaberulous, as much as 2.5 cm. broad. 12B. *S. setosa* var. *leiophylla*

1. *Setaria utowanaea* (Scribn. ex Millsp.) Pilger in Engler & Prantl, Die Nat. Pflanzenf. 14e: 72. 1940.

Basionym: *Panicum utowanaeum* Scribn. ex Millsp. in Field Museum Bot. 2: 25. 1900.

Type: Puerto Rico.

Syn.: *Panicum sintenisii* Nash in Bull. Torrey Bot. Club 30: 382. 1903. (Type: *Sintenis* 3463, Puerto Rico.)

Stoloniferous perennial with slender, glabrous culms 25-70 cm. tall. Ligule a row of short, stiff hairs. Blades flat, 8-20 cm. long, 1-3 mm. broad.

Panicle slender, 4-10 cm. long, the erect branches more or less remote, 1-3 cm. long, the terminal spikelets with a bristle equaling or exceeding the spikelet. Spikelets glabrous, broadly lanceolate or oblong, about 2 mm. long. First glume 3-nerved, obtuse, $\frac{1}{3}$ - $\frac{1}{2}$ as long as the second. Second glume and lower lemma 5-nerved, about equal or the glume slightly longer. Lemma of upper floret smooth, slightly beaked at apex.

GENERAL DISTRIBUTION: Cuba to Puerto Rico.

DISTRIBUTION IN LESSER ANTILLES: St. Martin, Barbuda, Antigua, St. Kitts, Guadeloupe, Martinique.

HABITAT: On open rocky soil, mostly near the coast.

2. *Setaria palmifolia* (Koenig) Stapf in Jour. Linn. Soc. Bot. 42: 186. 1914.

Basionym: *Panicum palmaefolium* Koenig, Naturforscher 23: 208. 1788.

Type: Description based on a specimen from Siam.

Perennial with culms 1-2 m. tall, the nodes puberulent, the internodes glabrous or sparsely villous. Sheaths ciliate on the margins, hispid on the collar. Ligule a line of hairs about 2 mm. long. Blades flat, strongly plicate, 2-6 cm. broad and as much as 50 cm. long, tapering at both ends, pubescent with short, straight hairs on abaxial surface and with a few long hairs on the upper surface. Panicles loose and open, as much as 40 cm. long, the lower branches to 10 cm. long, often rebranched. Panicle axis and branches scabrous. Spikelets lanceolate, acute at apex, 3-4 mm. long, appressed on short pedicels and branchlets, with only a portion of the spikelets subtended by bristles. Bristles about 5 mm. long, sometimes imperfectly developed. First glume obtuse, about half as long as spikelet, 3- to 5-nerved. Second glume about equaling lemma of upper floret, 7-nerved. Lower lemma 5-nerved, 3-4 mm. long with an involute tip extending nearly 1 mm. beyond tip of upper floret. Lemma and palea of upper floret obscurely transverse-rugose.

GENERAL DISTRIBUTION: Native to southeastern Asia; introduced in Jamaica.

DISTRIBUTION IN LESSER ANTILLES: Reported from the Lesser Antilles but no specimens have been seen by the writer.

HABITAT: Moist woodlands and shaded banks.

3. *Setaria paniculifera* (Steud.) Fourn., Mex. Pl. 2: 42. 1886.

Basionym: *Panicum paniculiferum* Steud., Syn. Pl. Glum. 1: 54. 1854.

Type: Mexico.

Syn.: *Panicum sulcatum* Aubl., Pl. Guian. 1: 50. 1775, non *Setaria sulcata* Raddi, 1823, based on *Panicum sulcatum* Bertol., 1820. (Type: French Guiana.)

Perennial with stout culms 1.5-4.0 m. tall. Culm nodes glabrous. Sheath margins and collar occasionally strigose or hispid. Ligule a ciliate mem-

brane 1-2 mm. long. Blades broad, strongly plicate, as much as 1 cm. broad and to 60 cm. long, tapering toward both ends, the basal end with a petiolelike constriction. Panicles large and open, as much as 70 cm. long, with compound lower branches as much as 25 cm. long. Panicle branches scabrous. Spikelets slender, pointed, 3.0-3.8 mm. long, loosely arranged along the lax panicle branches on pedicels 0.5-2.0 mm. long. Some but usually not all of the spikelets subtended by bristles (reduced pedicels) 10-15 mm. long. Lemma of lower floret about equaling lemma of upper floret. Palea of lower floret reduced, from vestigial to about half as long as the lemma. Upper floret about 3.5 mm. long, narrow, tapering to a firm point, smooth to finely rugose.

GENERAL DISTRIBUTION: Mexico and Central America south to northern South America. Rominger (in Illinois Biol. Monogr. 29: 19. 1962) reported this grass to be introduced in the Antilles.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Grenada.

HABITAT: Low, moist woodlands and shaded banks.

4. *Setaria barbata* (Lam.) Kunth, Rev. Gram. 1: 47. 1829.

Basionym: *Panicum barbatum* Lam., Tabl. Encycl. Méth. Bot. 1: 171. 1791.

Type: Mauritius.

Coarse, leafy annual with branching, decumbent and spreading culms to 2 m. long but often much less. Nodes pubescent. Sheaths fringed on margins and puberulent on collar. Ligule a fringed membrane about 1 mm. long. Blades narrowly elliptical, plicate, scabrous to hispid on both surfaces, to 30 cm. long and 3 cm. broad. Panicle branches contracted but often with loosely erect-spreading branches, mostly 3-10 cm. long. Spikelets narrow, awnless, 2.3-2.9 mm. long, on short pedicels, all but a few subtended by a flexuous bristle 5-8 mm. long. First glume short, broad, 3-nerved. Second glume and lemma of lower floret about equal, 7-nerved. Palea of lower floret about as large as the lemma. Upper floret acute, about 2.3 mm. long, the lemma and palea strongly transversely rugose.

GENERAL DISTRIBUTION: Native to tropical Asia, introduced in the warmer parts of the Americas.

DISTRIBUTION IN LESSER ANTILLES: Antigua, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Grenada, Barbados.

HABITAT: Moist, shaded habitats, often along trails, in thickets and weedy areas.

5. *Setaria geniculata* (Lam.) Beauv., Ess. Agrost. 51, 178. 1812.

Basionym: *Panicum geniculatum* Lam., Encycl. Méth. Bot. 4: 727. 1798.

Type: Guadeloupe.

Tufted perennial with culms 30-100 cm. or more tall from short, knotty rhizomes. Nodes glabrous. Leaves mostly glabrous or scabrous, sometimes with a few long hairs in vicinity of ligule. Sheaths, at least the lower ones, usually keeled. Ligule a short, fringed membrane. Blades flat, mostly 6-25 cm. long and 2-8 mm. broad. Panicles densely flowered, cylindrical, mostly 3-8 cm. long. Panicle axis puberulent, obscured by the spikelets. Bristles 4-12 below each spikelet, antrorsely scabrous, yellow, tawny, green or purple, variable in length but mostly 5-10 mm. long. Spikelets plump, rounded, mostly 2.5-3.0 mm. long, occasionally only 2 mm. long. Glumes thin, broad, the first about $\frac{1}{2}$ as long as spikelet, the second $\frac{2}{3}$ - $\frac{3}{4}$ as long. Lemma of lower floret about as long as lemma of upper floret. Lemma and palea of upper floret broad, indurate, transversely rugose, the lemma obtuse to slightly beaked at apex.

GENERAL DISTRIBUTION: Apparently native to the western hemisphere, widely distributed throughout the United States, Mexico, the Antilles, Central and South America.

DISTRIBUTION IN LESSER ANTILLES: St. Martin, Antigua, Saba, St. Eustatius, St. Kitts, Nevis, Montserrat, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Grenada, Barbados.

HABITAT: Usually in moist or wet soil along streams, ditches, and lake shores.

6. *Setaria glauca* (L.) Beauv., Ess. Agrost. 51, 178. 1812.

Basionym: *Panicum glaucum* L., Sp. Pl. 56. 1753.

Type: India.

Syn.: *Panicum lutescens* Weigel, Obs. Bot. 20. 1772. (Type: Germany, Pomerania.)

Setaria lutescens (Weigel) F. T. Hubb. in Rhodora 18: 232. 1916.

Tufted annual with culms 20-120 cm. tall, the culms usually geniculate below the branching at lower nodes. Nodes glabrous. Sheaths glabrous, compressed-keeled. Ligule a short, ciliate membrane. Blades mostly 4-10 mm. broad and to 30 cm. long, loosely twisted, scabrous on upper surface. Panicle densely flowered, cylindrical, mostly 3-15 cm. long, the closely placed spikelets and bristles obscuring the main puberulent or hispid axis. Bristles usually 4-12 below each spikelet, scabrous, yellowish, mostly 3-8 mm. long. Spikelets mostly 2.7-3.3 mm. long, similar to those of *S. geniculata* but conspicuously turgid. Lemma of upper floret strongly rugose in fine, transverse lines.

GENERAL DISTRIBUTION: Native to the Old World, now frequent throughout temperate, subtropical and tropical regions of the New World as a weed of cultivated fields.

DISTRIBUTION IN LESSER ANTILLES: Antigua, Saba, St. Eustatius, St. Kitts, Nevis.

HABITAT: A weed of cultivated fields, roadsides, and wasteplaces.

7. *Setaria verticillata* (L.) Beauv., Ess. Agrost. 51, 178. 1812.

Basionym: *Panicum verticillatum* L., Sp. Pl. ed. 2. 82. 1762.

Type: Europe.

Annual, 30-100 cm. tall, usually much-branched and geniculate-spreading at base. Nodes brownish-black, glabrous. Sheaths pilose on margins. Ligule very short, ciliate. Blades mostly 10-23 cm. long and 5-15 mm. broad, scabrous on both surfaces or occasionally with scattered hairs on adaxial surface. Panicles cylindric but often lobed and interrupted, mostly 5-15 cm. long. Bristles 1-3 times as long as spikelets, retrorsely scabrous to base. Spikelets 2.0-2.2 mm. long, oblong-elliptical, clustered on short branches with one bristle below each spikelet. First glume $\frac{1}{3}$ as long as second, the second glume about equaling the spikelet. Lemma of upper floret finely transverse-rugose.

GENERAL DISTRIBUTION: A weedy species, widespread in both hemispheres, and adventive in the Antilles.

DISTRIBUTION IN LESSER ANTILLES: Martinique, *Duss* 787.

HABITAT: Low, moist ditches and banks, often a weed of disturbed soils.

8. *Setaria tenax* (L. Rich.) Desv., Opusc. 78. 1831.

Basionym: *Panicum tenax* L. Rich. in Acta Soc. Hist. Nat. Paris 1: 106. 1792.

Type: French Guiana, Cayenne.

Syn.: *Setaria biconvexa* Griseb., Fl. Br. W. Ind. 555. 1864. (Type: Crueger, Trinidad.)

Leafy perennial 1-2 m. tall, with culms often geniculate-spreading. Nodes glabrous. Sheaths densely ciliate on margins with papilla-based hairs, the collar densely villous. Ligule a ring of hairs 1-2 mm. long. Blades mostly 15-30 cm. long and 10-20 mm. broad, abruptly rounded at base, acuminate at apex. Panicles 10-35 cm. long, rather loose but the branches all short, the main axis angular, scabrous, densely villous with papilla-based hairs. Bristles single below each spikelet, 1-2 cm. long, bearing antrorse and retrorse barblets intermixed, sometimes the antrorse barblets restricted to the basal half and the retrorse barblets on the upper half. Spikelets nearly spherical, 2.0-2.5 mm. long. First glume short, the second glume and lemma of lower floret only about half as long as the rugose, globose, yellowish-brown lemma and palea of the upper floret.

GENERAL DISTRIBUTION: The Antilles and southern Mexico south to Trinidad and French Guiana.

DISTRIBUTION IN LESSER ANTILLES: Dominica, Barbados.

HABITAT: On moist, shady slopes and in open woodlands.

9. *Setaria magna* Griseb., Fl. Br. W. Ind. 554. 1864.

Type: *Purdie*, Jamaica.

Stout annual, the culms to 4 m. tall, usually not branched at base and little-branched above. Sheaths villous along margins. Ligule a ciliate membrane 1-2 mm. long. Blades scabrous, especially on the thick margins, mostly 1.0-3.5 cm. broad and as much as 60 cm. long. Panicles densely flowered, cylindrical, usually 25-40 cm. long and 2-3 cm. thick, the axis scabrous and densely villous. Panicle branches to 1.5 cm. long, the numerous short-pedicelled spikelets each subtended by 1 or 2 bristles. Bristles flexuous, antrorsely scabrous, 1-2 cm. long. Spikelets elliptical, rounded at apex, 1.8-2.0 mm. long. First glume short, the second glume and lemma of lower floret about equal and as long as or slightly longer than the upper floret. Lemma of upper floret about 1.8 mm. long, hard, smooth and shiny, brownish, minutely rugose, with a palea of similar texture.

GENERAL DISTRIBUTION: New Jersey south to Florida, Texas, Mexico, Central America and the Antilles.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe, Martinique.

HABITAT: In saline or brackish marshes along the coast.

10. *Setaria italica* (L.) Beauv., Ess. Agrost. 51. 1812.

Basionym: *Panicum italicum* L., Sp. Pl. 56. 1753.

Type: India.

Syn.: *Setaria viridis* subsp. *italica* (L.) Briquet, Prodr. Pl. Corse 1: 68. 1910.

Tall, coarse, leafy annual; a cultivated species similar to *S. viridis* (L.) Beauv., with many agricultural varieties. Culms robust, the internodes as much as 1 cm. thick. Leaves broad and long. Panicles dense, as much as 30 cm. long and 3 cm. thick, usually lobed, yellow or purple. Bristles below spikelets antrorsely barbed, mostly 2-9(-12) mm. long. Spikelets about 3 mm. long, disarticulating above the glumes and lower floret. Palea of lower floret half as long as lemma. Lemma and palea of upper floret smooth and shiny.

GENERAL DISTRIBUTION: Cultivated in Asia and Europe since prehistoric time, now recorded at widely separated localities in the United States and the Antilles from plantings.

DISTRIBUTION IN LESSER ANTILLES: Martinique, *Duss 1315* (G, NY).

HABITAT: Widely seeded in both the Old World and New World as a forage plant, and as a grain (common millet) for human consumption in Asia. Now occasional in wasteplaces.

11. *Setaria rariflora* Mikan ex Trin. in Spreng., Neue Entdeck. 2: 78. 1821.

Type: Brazil.

Perennial with culms mostly 30-70 cm. tall, often decumbent-erect and branching at lower nodes. Nodes glabrous or sparsely hispid. Sheaths

keeled, ciliate on margins above, sparsely pubescent on back. Ligule densely ciliate, less than 1 mm. long. Blades usually 2-5 mm. broad, narrow at base. Panicles slender, interrupted and sparsely flowered, 5-15 cm. long, with a loosely villous main axis. Bristles usually 1 below each spikelet, occasionally absent, antrorsely scabrous, 4-7 mm. long. Spikelets about 2 mm. long. Palea of lower floret about as long as lemma. Lemma and palea of upper floret finely transverse-rugose.

GENERAL DISTRIBUTION: South America; adventive in southern United States, the Antilles and northeastern Mexico.

DISTRIBUTION IN LESSER ANTILLES: St. Martin, Antigua, St. Eustatius, St. Kitts, Redonda, Guadeloupe, Martinique.

HABITAT: Moist, shaded bluffs, dry slopes and in forests.

Setaria rariflora is closely related to and perhaps not specifically distinct from the variable populations of the typical variety of *S. setosa* which characteristically have slightly broader blades.

12A. *Setaria setosa* (Sw.) Beauv., Ess. Agrost. 51, 171, 178. 1812, var. *setosa*.

Basionym: *Panicum setosum* Sw., Prodr. 22. 1788.

Type: Jamaica.

Syn.: *Panicum branchiatum* Poir. in Lam., Encycl. Méth. Bot. Suppl. 4: 282. 1816. (Type: "Antilles.")

Perennial with erect or decumbent-spreading culms mostly 50-100 cm. tall from a firm, often somewhat woody base. Nodes usually glabrous. Sheaths ciliate on margins above, the collar often hispidulous. Ligule a ciliate ring about 1 mm. long. Blades flat or folded, 15-25 cm. long, 6-12 mm. broad, usually pilose on one or both surfaces, occasionally glabrous or scabrous. Panicle variable, loosely spicate to rather open and with spreading branches to 2.5 cm. long, mostly 10-20 cm. long. Panicle branches scabrous and often sparsely villous. Bristles single below each spikelet, antrorsely scabrous, usually 5-10 mm. long. Spikelets 2.0-2.5 mm. long. First glume $\frac{1}{2}$ as long as spikelet, acute, the second glume obtuse, $\frac{2}{3}$ as long as spikelet and shorter than lemma of lower floret. Lower floret with a palea as long as the lemma. Lemma and palea of the upper floret ovate-lanceolate, finely transverse-rugose, slightly apiculate at tip.

GENERAL DISTRIBUTION: Trinidad; introduced on the eastern coast of the United States.

DISTRIBUTION IN LESSER ANTILLES: St. Martin, Antigua, Saba, St. Eustatius, St. Kitts, Nevis, Redonda, Guadeloupe, Dominica, St. Lucia, St. Vincent.

HABITAT: Mostly on rocky, rather dry, open hillsides.

Two sheets of specimens of *Duss 2698* at NY were either collected at different sites or at different times. One of these sheets is herein referred to *S. setosa* var. *setosa*, the other to *S. setosa* var. *leiophylla*.

12B. *Setaria setosa* (Sw.) Beauv. var. *leiophylla* (Nees) Arach. in Anal. Mus. Nac. Montevideo 1: 171. 1894.

Basionym: *Panicum leiophyllum* Nees, Agrost. Bras. 249. 1829.

Type: Brazil.

Syn.: *Setaria leiophylla* (Nees) Kunth, Rev. Gram. 1: Sup. 12. 1830.

This taxon is accorded varietal status by Rominger (in Illinois Biol. Monogr. 29: 60. 1962) who states: "This variety differs from *Setaria setosa* (Swartz) Beauvois [var. *setosa*] as it possesses very broad blades which lack pubescence. The blades are usually 1.5-2.5 cm. wide, acuminate at the tip, rounded abruptly at the base, scaberulous above, glabrous below. The panicle, as much as 30 cm. long, is usually open, attenuate above, the branches remote, ascending, 1.5-2.5 cm. long. In other morphological characters it closely resembles *S. setosa*, but generally is more robust and the leaf blades are of a much richer, deeper green. . . . The panicle and spikelets are not distinct from *S. setosa*."

GENERAL DISTRIBUTION: The Antilles and Brazil.

DISTRIBUTION IN LESSER ANTILLES: Antigua, Dominica, Martinique.

HABITAT: On dry limestone hills and in shady, wooded places.

49. PENNISETUM L. Richard

Pennisetum L. Rich. in Pers., Syn. Pl. 1: 72. 1805.

FIGURE 40.

Annuals and perennials, mostly with tall, stiffly erect culms but one species with decumbent or prostrate stoloniferous culms. Ligule a short membrane densely ciliate with long hairs. Inflorescence a dense, bristly, elongated, tightly contracted panicle, the spikelets solitary or in groups of 2-several in fascicles of numerous bristles. Bristles (reduced branchlets) separate to base, not connate. Spikelets disarticulating with the bristles at maturity. Spikelets awnless, 2-flowered, the upper perfect, the lower staminate or neuter. First glume small and vestigial. Lemma and palea of upper floret thin, smooth and shiny, the lemma margins thin and flat.

TYPE SPECIES: *Alopecurus typhoides* Burm. f., now correctly known as *Pennisetum typhoideum* (Burm. f.) L. Rich.

A genus of about 80 species, in the tropics and subtropics of both hemispheres.

KEY TO THE SPECIES

1. Panicle bristles usually tawny, sparsely plumose; panicle axis densely pilose; spikelets 2-3 in each fascicle. 1. *P. purpureum*

- 1a. Panicle bristles yellow to brown or reddish-purple, densely plumose below; panicle axis scabrous; spikelets solitary in each fascicle. 2. *P. setosum*

1. *Pennisetum purpureum* Schumach., Beskr. Guin. Pl. 64. 1827.

Type: Guinea.

Robust, leafy perennial with culms 2-4 m. tall and long blades 15-40 mm. broad. Ligule a ring of hairs 2-3 mm. long. Sheaths glabrous to long-hairy on the margins. Blades narrow at base, often ciliate on lower margins and hispid or pilose on adaxial surface above ligule but otherwise glabrous. Panicles narrow, contracted, mostly 10-25 cm. long, the fascicles sessile and closely placed on the densely hairy main axis. Fascicles mostly with 2 or 3 spikelets, the bristles scabrous, occasionally sparsely plumose below, of unequal length, some over 10 mm. long. Spikelets mostly 4-7 mm. long, with thin, glabrous glumes and lemmas.

GENERAL DISTRIBUTION: Cultivated as a forage plant in the warmer parts of the world, occasionally persisting as an escape.

DISTRIBUTION IN LESSER ANTILLES: Antigua, St. Lucia, Grenada.

HABITAT: An occasional escape from cultivation in moist ditches and other disturbed areas.

2. *Pennisetum setosum* (Sw.) L. Rich. in Pers., Syn. Pl. 1: 72. 1805.

Basionym: *Cenchrus setosum* Sw., Prodr. 26. 1788.

Type: West Indies.

Stout perennial often in large, dense clumps, the culms mostly 1-2 m. tall, with flowering branches at the lower and middle nodes. Ligule a ring of long hairs. Blades mostly 10-40 cm. long and 4-20 mm. broad, scabrous on the margins and often hairy on adaxial surface above ligule. Panicles 10-25 cm. long, dense and often flexuous, pale yellow to brown or purple. Fascicles with a single floret, very short-pedicel, with scabrous bristles of unequal length, these densely silky-plumose below. Caryopsis slender, shiny, elongate, about 2.5 mm. long.

GENERAL DISTRIBUTION: Southern Florida, the Antilles, and Mexico to Brazil and Bolivia.

DISTRIBUTION IN LESSER ANTILLES: St. Martin, St. Eustatius, St. Kitts, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Grenada, Barbados.

HABITAT: Moist, open soil.

50. CENCHRUS Linnaeus

Cenchrus L., Sp. Pl. 1049. 1753.

FIGURE 41.

Annuals and perennials, many with weak, geniculate culms. Ligule a densely ciliate rim or short membrane. Leaf sheaths typically compressed-

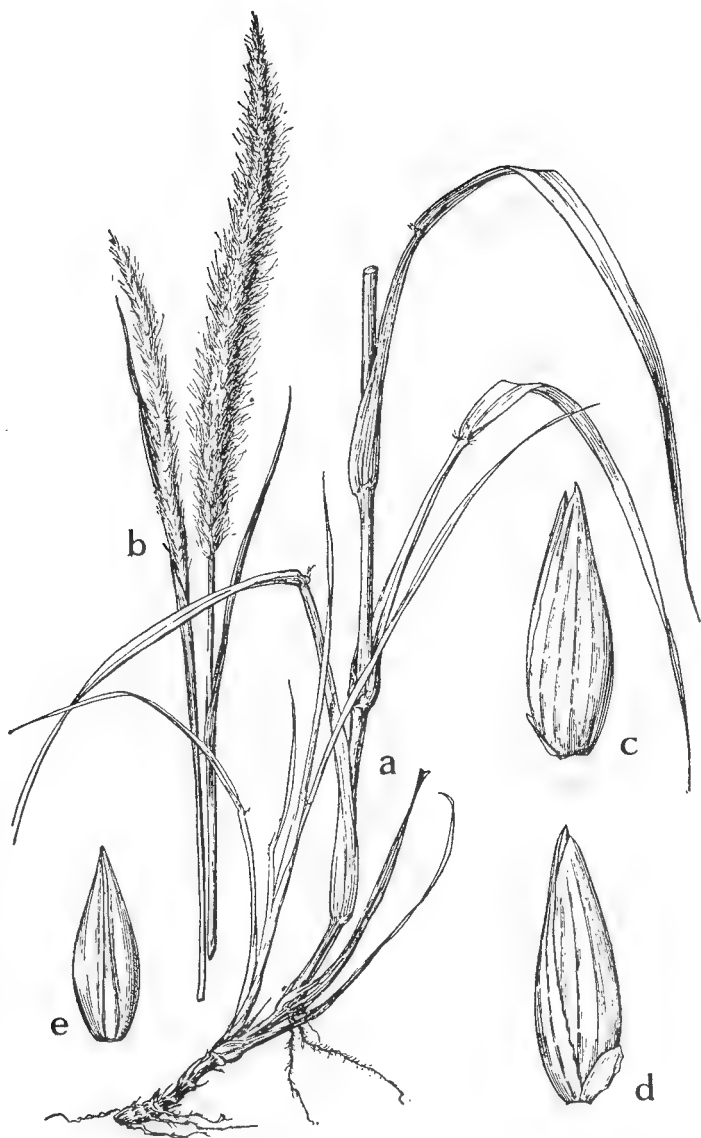


FIGURE 40. Poaceae. a-e, *Pennisetum setosum*: a, habit, $\times 0.5$; b, inflorescence, $\times 0.5$; c, d, two views of spikelet, $\times 10$; e, floret, $\times 10$. (Reprinted from Hitchcock, Manual of the grasses of the West Indies, p. 358, fig. 329. 1936.)

keeled and blades usually flat. Spikelets enclosed in burrs, with 1-8 in each burr, the burr readily disarticulating as a unit. Burrs formed by bristles and/or spines fused together at least at base, the bristle and spines usually retrorsely scabrous. Spikelets 2-flowered, the lower floret staminate or neuter, the upper perfect. Glumes thin, membranous, unequal. Lemma and palea of lower floret about equal and as long as or longer than the glumes. Lemma of upper floret thin, membranous, tapering to a slender, usually acuminate tip, the margins flat, not inrolled over the palea. Carpopsis elliptic to ovoid, dorsally flattened.

TYPE SPECIES: *Cenchrus echinatus* L.

In his monographic treatment of *Cenchrus*, DeLisle (in Iowa St. Coll. Jour. Sci. 37: 259-351. 1963) recognized 20 species. Most of the species are native only to the Americas but a few are important grasses in the warmer parts of Asia, Africa, and Australia.

KEY TO THE SPECIES

1. Flattened spines of burr mostly or all fused together to at least halfway above base; burr typically broader than long, usually truncate and with a ring of slender bristles at base. 2
- 1a. Flattened spines present at irregular intervals throughout body of burr; burr typically longer than broad, deeply cleft on either side, rounded and with few or no slender bristles at base. 3. *C. incertus*
2. Burrs closely crowded and rather uniformly arranged in the inflorescence; outer bristles, at least some, equaling or exceeding the inner spines. 1. *C. brownii*
- 2a. Burrs loosely spaced in the inflorescence; outer bristles mostly about $\frac{1}{2}$ the length of the inner spines. 2. *C. echinatus*

1. *Cenchrus brownii* Roem. & Schult., Syst. Veg. 2: 258. 1817.

Type: *Brown 6140*, in 1803. Australia. Arnheim, South Bay (holotype, BM; fragment, US).

Syn: *Cenchrus inflexus* R. Br., Prodr. Fl. Nov. Holl. 1: 195. 1810. (Type: BM; fragment, US.)

Annual with culms 30-100 cm. tall from a more or less geniculate and spreading base. Sheaths only slightly compressed. Blades thin, flat, glabrous or slightly pilose on upper surface and margins. Inflorescence dense, mostly 3-12 cm. long and 1.0-1.5 cm. thick. Burr tawny, globose, as broad as tall except for the long basal bristles, villous on peduncle and lower part of burr. Inner spines short and very broad, mostly 2-4 mm. long. Outer spines and bristles numerous, as long as or longer than the broad inner spines. Spines and bristles retrorsely barbed. Spikelets 2-3 per burr, 4-6 mm. long.

GENERAL DISTRIBUTION: Throughout the Antilles, Mexico, Central and South America, and occasionally in southern United States. Also widely introduced in Asia, Africa, Australia and islands of the Pacific.



FIGURE 41. Poaceae. a-c, *Cenchrus incertus*: a, habit, $\times 0.2$; b, burr, $\times 2$; c, spikelet, $\times 3$. (Reprinted from Gould, Grasses of the Texas Coastal Bend, p. 45, fig. 37. 1965.)

DISTRIBUTION IN LESSER ANTILLES: Antigua, Guadeloupe, Martinique, Barbados.

HABITAT: On sandy, loose soils of ditches, roadways, borders of woods, and other disturbed sites.

2. *Cenchrus echinatus* L., Sp. Pl. 1050. 1753.

Type: Holotype in Linnaean Herbarium with no indication as to its origin (DeLisle, 1963). With the description of the species, however, a specimen collected by Sloane in Jamaica is cited.

Annual with erect culms from a decumbent-spreading base, the culms mostly 30-60 cm. long but occasionally much longer. Blades linear, flat, glabrous or pubescent, 3-8(-11) mm. broad. Inflorescence 2-10 cm. long, the burrs close but not densely crowded on an angled, scabrous rachis. Burrs broad and truncate below, 5-10 mm. tall and 3.5-6.0 mm. wide with a fringe of bristles at base that are shorter than the body of the burr. Tips of inner bristles often purple-tinged. Peduncle of burr broad, pubescent. Spikelets 2-3 per burr, 5-7 mm. long. Upper (perfect) floret 4.7-7.0 mm. long.

GENERAL DISTRIBUTION: Throughout southern United States, Central America and the West Indies, and in the warmer parts of South America. Introduced and widely distributed on the islands of the Pacific and Australia.

DISTRIBUTION IN LESSER ANTILLES: Anguilla, St. Barthelemy, Antigua, Saba, St. Kitts, Nevis, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, the Grenadines, Grenada, Barbados.

HABITAT: A weed of beaches, roadsides, ditches, sandy pastures and wastelands.

Cenchrus echinatus is generally similar to *C. brownii* but has broader peduncles, slightly larger burrs with fewer and shorter bristles, and longer rachis internodes and spikelets. The burrs of *C. echinatus* frequently are purple-tinged whereas the burrs of *C. brownii* consistently are tawny. The ring of slender bristles at the base of the burr, and the broad, truncate base of the burr separates these two species from *C. incertus*.

3. *Cenchrus incertus* M. A. Curtis in Boston Jour. Nat. Hist. 1: 135. 1837.

Type: M. A. Curtis 1837, North Carolina. Cape Fear R. (holotype, NY).

Syn.: *Cenchrus pauciflorus* Benth., Bot. Voy. Sulph. 56. 1844. (Holotype, BM; fragment, US.)

Annual or short-lived perennial. Culms commonly geniculate-spreading or stoloniferous at base, mostly 10-80 cm. long. Sheaths laterally compressed, glabrous or sparsely pilose. Hairs of ligule 0.5-1.5 mm. long.

Blades thin, flat, mostly 2-18 cm. long and 2-6 mm. broad. Inflorescence 1.5-8.0(-9.0) cm. long, the rachis with internodes 2-5 mm. long. Burrs ovoid to globose, with clefts on two sides, pubescent or infrequently glabrous, often purple-tinged. Spines 8-40 per burr, irregularly protruding from body of burr, retrorsely barbed, mostly flattened at base but highly variable in shape and length. Spikelets 2-4 per burr, mostly 3.5-5.8 mm. long.

GENERAL DISTRIBUTION: Throughout southern United States and south through Mexico, Central and South America and islands of the Caribbean. Also introduced and weedy in South Africa.

DISTRIBUTION IN LESSER ANTILLES: Anguilla, St. Barthelemy, Barbuda, Antigua, St. Kitts and Guadeloupe.

HABITAT: A weed of beaches, roadsides, sandy pastures and other disturbed areas.

51. ANTHEPHORA Schreber

Anthephora Schreb., Besch. Grass. 2: 105, pl. 44. 1810.

Tufted annuals with spreading-erect culms, or the culms trailing, many-noded and rooting at the nodes. Ligule membranous. Inflorescence slender, spike-like, with 1-flowered spikelets in clusters of 4, the indurate first glumes united at base, the spikelet clusters readily deciduous as a whole from the zigzag main rachis. Second glume 5-nerved, narrowed to a blunt tip. Lemma ovate-acuminate, 3-nerved, firm, the broad flat margins enclosing the palea.

TYPE SPECIES: *Anthephora hermaphrodita* (L.) Kuntze, based on *Tripsacum hermaphroditum* L.

Species five, one in the New World tropics and four in Africa.

1. *Anthephora hermaphrodita* (L.) Kuntze, Rev. Gen. Pl. 2: 759. 1891.

Basionym: *Tripsacum hermaphroditum* L., Syst. Nat. ed. 10. 2: 1261. 1759.

Type: Jamaica.

Annual with culms erect, geniculate-spreading, or decumbent and rooting at lower nodes, the erect branches 15-50 cm. tall. Ligule a thin, brown membrane 1.5-3.0 mm. long. Herbage hispid to scabrous or glabrous. Blades thin, flat or folded, mostly 5-20 cm. long and 3-8 mm. broad. Inflorescences 5-10 cm. long, 5-7 mm. thick, the spikelet clusters readily deciduous from the angular, zigzag rachis. First glumes mostly 5-7 mm. long, thick and broad, acute or acuminate at apex.

GENERAL DISTRIBUTION: Southern Mexico and the Antilles southward to Brazil and Peru.

DISTRIBUTION IN LESSER ANTILLES: St. Martin, Antigua, Saba, St. Eustatius, St. Kitts, Montserrat, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Grenada, Barbados.

HABITAT: A common weed of low, moist soils, frequent in disturbed sites.

52. *MISCANTHUS* Andersson

Miscanthus Anderss. in Oefv. Sv. Vet. Akad. Forh. 1855: 165. 1855.

FIGURE 42.

Tall, stout perennials with usually long, flat blades. Ligule a lacerate membrane. Inflorescence a large panicle with numerous long, erect-spreading branches, these rebranched only near base. Spikelets awned, all alike and with one perfect floret and a reduced floret (reduced to a scale) below, in unequally pediceled pairs, usually with a ring of long spreading hairs at base.

TYPE SPECIES: *Eulalia japonica* Trin., now correctly known as *Miscanthus sinensis* Anderss.

Species about 20, native to Africa, Japan and the Philippine Islands.

1. *Miscanthus sinensis* Anderss. in Oefv. Sv. Vet. Akad. Forh. 1855: 166. 1855.

Type: China.

Culms 1-2 m. tall in large clumps. Sheaths ciliate on margins. Leaves to 80 cm. long, 10-15 mm. broad, finely serrate on margins. Panicles 20-40 cm. long, with erect-spreading branches to 20 cm. long. Spikelets 4-5 mm. long, with a ring of spreading hairs mostly 5-7 mm. long at base. Glumes thin but firm, nearly equal in length but the first slightly longer, narrowing to an attenuate or slightly notched tip. Upper glume often ciliate on margins. Lemma of lower floret membranous and colorless, translucent. Lemma of upper floret membranous, translucent, with an awn usually 7-10 mm. long from a toothed apex, this undulate and untwisted or geniculate and with the lower section twisted.

GENERAL DISTRIBUTION: Native to China, widely distributed in tropical regions as an ornamental garden plant and occasionally occurring as an escape.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe, *Duss* 4225.

HABITAT: Mainly occurring as a cultivated ornamental but occasionally an escape in wastelaces.

53. *IMPERATA* Cyrillo

Imperata Cyrillo, Pl. Rar. Neap. 2: 26. 1792.

Coarse perennial grasses, the culms erect from a firm, often rhizomatous base. Blades flat, long and narrow, tapering to a narrow base. Spikelets



FIGURE 42. Poaceae. a-c, *Miscanthus sinensis*: a, habit, much reduced; b, raceme, $\times 0.5$; c, spikelet, $\times 5$. (Reprinted from Hitchcock, Manual of the Grasses of the United States, p. 741, figure 1127. 1951.)

awnless, all alike, two-flowered, with one perfect floret above and a reduced (scalelike) floret below. Spikelets in long, narrow, silky panicles, the spikelets in unequally pediceled pairs on a continuous rachis, the spikelets falling separately. Glumes about equal, membranous. Lemma of lower floret, upper floret and palea thin, hyaline.

TYPE SPECIES: *Imperata arundinacea* Cyrillo.

Species seven, in tropical and subtropical regions of both hemispheres.

1. ***Imperata contracta*** (H.B.K.) Hitchc. in Rep. Missouri Bot. Gard. 4: 146. 1893.

Basionym: *Saccharum contractum* H.B.K., Nov. Gen. Sp. 1: 182. 1816.

Type: Colombia, "on banks of the Magdalena River."

Rhizomatous perennial with culms 1.0–1.5 cm. tall, solitary or in small clumps. Leaves mostly in a basal cluster. Blades long and linear, 5–10 mm. broad, conspicuously long-hairy on adaxial surface above ligule. Panicle contracted, densely flowered, mostly 20–40 cm. long and 2–4 cm. broad, the lower branches to 2–6 cm. long. Spikelets about 3 mm. long. Glumes membranous. Lemmas hyaline.

GENERAL DISTRIBUTION: Antilles and southern Mexico to Brazil.

DISTRIBUTION IN LESSER ANTILLES: Dominica, Guadeloupe, Martinique.

HABITAT: Occasional in cultivation as an ornamental and as an escape.

54. SACCHARUM Linnaeus

Saccharum L., Sp. Pl. 54. 1753.

FIGURE 43.

Stout rhizomatous perennials with thick, many-jointed culms as much as 4 or 5 m. tall. Sheaths overlapping, rounded, glabrous or pubescent. Blades long, flat and broad. Inflorescence a large, dense, plumelike panicle. Spikelets all alike, awnless, in pairs of one sessile and one pediceled, the sessile spikelet falling attached to the pedicel and rachis joint. Spikelets 2-flowered, the upper floret perfect, the lower neuter. Glumes firm, 1- to 3-nerved, acute or acuminate. Lemma of lower floret similar to glumes but hyaline; sometimes short or absent.

TYPE SPECIES: *Saccharum officinarum* L.

A genus of five species, found in the tropics and subtropics of the world. *Saccharum officinarum* is the sugar cane of commerce.

1. ***Saccharum officinarum*** L., Sp. Pl. 54. 1753.

Type: India.

Perennial with many-noded, firm, thick and succulent culms 2–3 cm. thick. Sheaths overlapping, soon deciduous. Blades flat, furrowed, to 5 cm. broad, with a very thick midrib. Panicles to 1 m. in length, silvery-hairy,

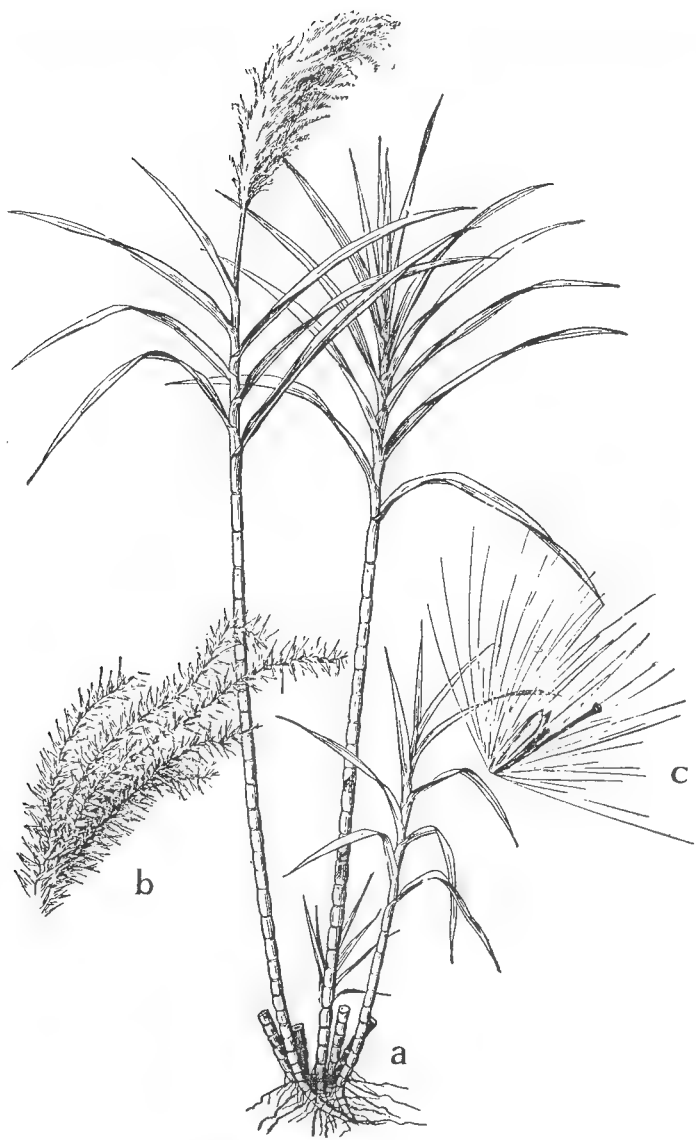


FIGURE 43. Poaceae. a-c, *Saccharum officinarum*: a, habit, much reduced; b, racemes, $\times 0.5$; c, spikelet with pedicel and rachis joint, $\times 5$. (Reprinted from Hitchcock, Manual of the grasses of the United States, p. 742, fig. 1128. 1951.)

with numerous long, slender, racemose branches. Spikelets 3-4 mm. long, surrounded by silky hairs to 10 mm. or more long. Branch rachis readily disarticulating at the nodes at maturity.

GENERAL DISTRIBUTION: Cultivated in the tropics and subtropics of the world.

DISTRIBUTION IN LESSER ANTILLES: Introduced as a cultivated crop on several of the islands; collection records from Antigua, Guadeloupe, Martinique, and Barbados.

HABITAT: Cultivated, occasionally growing as an escape.

Hitchcock (Man. Grasses W. I. 380. 1936) reported a second species in the islands, *S. ciliare* Anderss., which apparently had been grown as an ornamental; the specimen *Box 162* from St. Kitts is cited.

55. SORGHUM Moench

Sorghum Moench, Meth. Pl. 207. 1794.

FIGURE 44.

Annuals and perennials, many with tall, stout culms. Ligule a ciliate membrane. Blades usually long, flat and broad. Inflorescence an open or contracted, branching panicle. Spikelets in pairs of one sessile and perfect and one pediceled and staminate, at the branch tips each sessile spikelet associated with 2 pediceled spikelets. Spikelets with a single perfect floret above a single staminate floret. Disarticulation below sessile spikelet, the rachis section and pedicel or pedicels falling attached to sessile spikelet. Glumes coriaceous, firm, about equal in length. Lemma of lower floret and lemma and palea of upper floret thin and hyaline.

TYPE SPECIES: *Sorghum bicolor* (L.) Moench, based on *Holcus bicolor* L.

A genus of about 50 species, in the warmer parts of the world. Most systematists now include under *S. bicolor* many agricultural races that until recently were recognized as distinct species.

KEY TO THE SPECIES

- 1. Plants perennial, with stout rhizomes. 1. *S. halepense*
- 1a. Plants annual, without rhizomes. 2. *S. bicolor*

1. *Sorghum halepense* (L.) Pers., Syn. Pl. 1: 101. 1805.

Basionym: *Holcus halepensis* L., Sp. Pl. 1047. 1753.

Type: Syria.

Coarse perennial with extensive, fleshy, creeping rhizomes. Culms mostly 1-2 m. tall under favorable growing conditions. Ligule a truncate, ciliate membrane. Blades long, linear, mostly 0.8-1.5(-2.0) cm. broad. Panicle large, open, freely branched, mostly 15-35 cm. long. Sessile spikelets 4.5-5.5 mm. long, awnless or with a delicate, geniculate, readily deciduous awn 1.0-1.5 mm. long. Glumes of sessile spikelet broad, nerveless and shiny

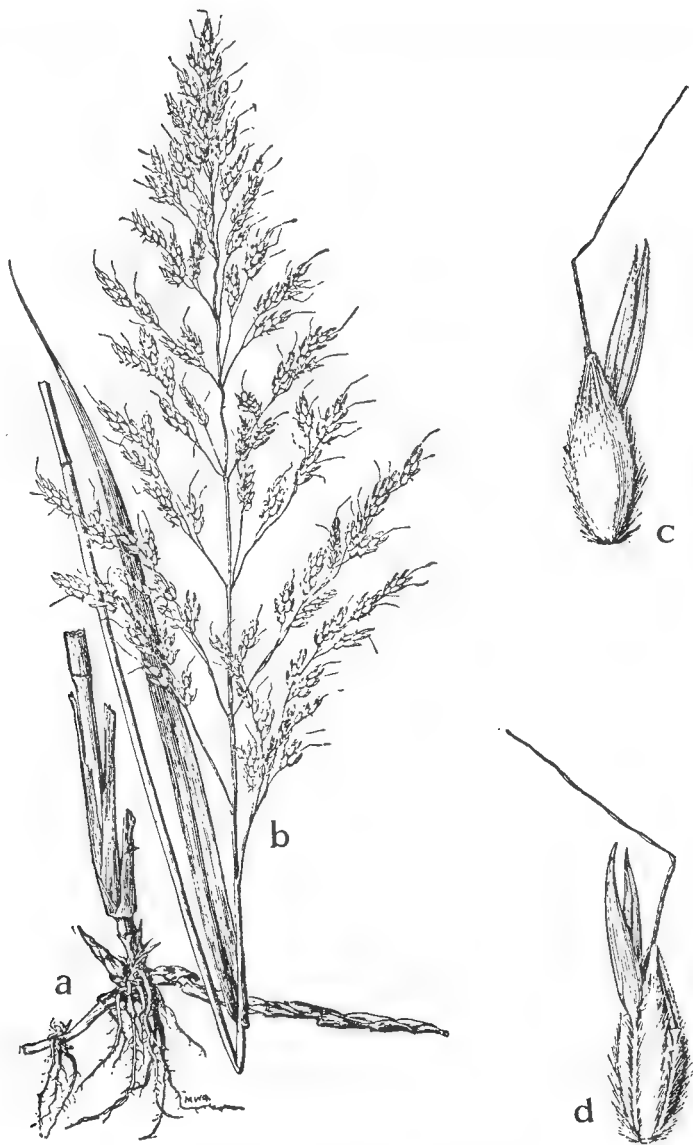


FIGURE 44. Poaceae. a-d, *Sorghum halepense*: a, culm base, $\times 0.5$; b, inflorescence, $\times 0.5$; c, d, two views of terminal raceme, $\times 5$. (Reprinted from Hitchcock, Manual of the grasses of the West Indies, p. 408, fig. 361. 1936.)

except at tip, pubescent at least on margins. Pediceled spikelets awnless, usually staminate, as long as the sessile ones but narrower and thinner and with more strongly nerved glumes. Caryopsis 2-3 mm. long.

GENERAL DISTRIBUTION: Common throughout the temperate and warmer regions of the world, apparently native to southern Europe.

DISTRIBUTION IN LESSER ANTILLES: St. Kitts, Guadeloupe, St. Lucia, St. Vincent, and the Grenadines.

HABITAT: Disturbed, moist soil, often a common weed of roadsides and ditches.

Most *Sorghum* collections from Lesser Antilles locations appear to be *S. bicolor*, but as most specimens lack the plant base, these identifications can only be tentative. These could well be either *S. halepense* or *S. bicolor*.

2. *Sorghum bicolor* (L.) Moench, Meth. Pl. 207. 1794.

Basionym: *Holcus bicolor* L., Mant. Pl. 2: 301. 1771.

Type: *D. Lerche*, Persia.

Syn.: *Sorghum vulgare* (L.) Pers., Syn. Pl. 1: 101. 1805.

Large, succulent annual with culms mostly 1-2 m. tall and long, thin blades 1-5 cm. broad. Inflorescence highly variable, usually a compact panicle 10-20 cm. long with thick, short branches and pedicels. Spikelets 4-6 mm. long, awnless or awned. Glumes pubescent, usually with a glabrate, shiny area on back.

GENERAL DISTRIBUTION: Widely cultivated throughout the warmer parts of the world, probably of African origin.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe, Martinique.

HABITAT: An occasional escape from cultivation, most commonly along roads and ditches.

56. ISCHAEMUM Linnaeus

Ischaemum L., Sp. Pl. 1049. 1753.

FIGURE 45.

Mostly caespitose perennials, a few annual, with rounded culms, flat blades, and hairy ligules. Inflorescence a spicate raceme or a panicle of 2-numerous short, spicate branches. Spikelets in pairs of 1 sessile and 1 pediceled, the sessile spikelet with 1 perfect floret and a reduced floret below, the pediceled spikelet variously reduced, rarely with a perfect, fruitful floret. Glumes firm to indurate, acute, acuminate or the second glume short-awned. Lemmas and paleas thin, usually hyaline, the lemma of the upper floret of the sessile spikelet usually 2-cleft and geniculately awned from the notch.

TYPE SPECIES: *Ischaemum muticum* L.

Species about 40, mostly in the warm regions of the Old World tropics, a few in the Americas.

1. *Ischaemum latifolium* (Spreng.) Kunth, Rev. Gram. 1: 168. 1829.

Basionym: *Andropogon latifolius* Spreng., Syst. Veg. 1: 286. 1825.

Type: *Bertero s.n.*, Basse-Terre, Guadeloupe.

Syn.: *Ischaemopogon latifolius* Griseb., Fl. Br. W. Ind. 560. 1864.

Coarse, freely branched annual with erect culms 60–100 cm. tall or culms becoming long and trailing, often rooting at the lower nodes. Sheaths hairy on the collar, otherwise glabrous. Ligule a dense ring of hairs 2–5 mm. long. Blades lanceolate, 0.8–3.0 cm. broad, abruptly narrowing at base. Inflorescence a flabellate cluster of closely placed spicate branches mostly 4–9 cm. long. Rachis joints and sometimes the pedicels with a tuft of long, soft hairs. Spikelets about 4 mm. long, the membranous lemma of the upper floret with a flexuous, slightly geniculate awn 7–12 mm. long.

GENERAL DISTRIBUTION: Trinidad, and southern Mexico to Colombia, Venezuela, Ecuador and Brazil.

DISTRIBUTION IN LESSER ANTILLES: Dominica, Guadeloupe, Martinique, St. Vincent.

HABITAT: Moist, exposed or shaded sites.

57. ARTHRAXON Beauvois

Arthraxon Beauv., Ess. Agrost. III, table XI, fig. 6. 1812.

Low, slender annuals or perennials with small inflorescences of 2–few spicate branches. Spikelets with a single perfect terminal floret and a much-reduced floret below. Spikelets in pairs, or solitary and with the pediceled spikelet reduced. Glumes large, firm, rounded on back, the lower glume 5- to 7-nerved, the upper glume much narrower, 3-nerved. Lemmas of upper and lower florets thin and hyaline; lemma of upper floret with a fine, geniculate awn.

TYPE SPECIES: *Arthraxon ciliare* Beauv.

A genus of about 15–20 species, distributed mainly in the tropics of the Old World, with one species rather widely introduced in the Americas.

1. *Arthraxon quartinianus* (A. Rich.) Nash, N. Am. Fl. 17: 99. 1912.

Basionym: *Alectoria quartiniana* A. Rich., Tent. Fl. Abyss. II: fig. 6. 1812.

Type: Abyssinia.

Syn.: *Arthraxon ciliaris* Beauv. subsp. *quartinianus* Hack. in DC., Monogr. Phan. 6: 356. 1889.

Annual with delicate, decumbent-erect culms 15–60 cm. tall. Sheaths ciliate on margins, hairy at base (on node), shorter than the culm inter-

nodes. Blades short, broad, subcordate, ciliate at base, mostly 1-4 cm. long and 4-12 mm. broad. Inflorescence of 1-4(-8) spikes or spicate branches mostly 1-3 cm. long. Spikelets solitary or infrequently the lower ones paired on a slender, ciliate rachis, the rachis disarticulating at the nodes. Spikelets 2.6-3.2 mm. long. Glumes purple at maturity, finely rugose, coarsely scabrous on upper one-third. Awn of lemma 3-5 mm. long.

GENERAL DISTRIBUTION: Southern Mexico, Guatemala.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe, *Duss* 2712 (US), 3136 (US, NY).

HABITAT: On moist open slopes.

58. DICHANTHIUM Willemet

Dichanthium Willemet in Ann. Bot. Usteri 18: 11. 1796. FIGURE 45.

Low to moderately tall perennials, some with extensive, creeping stolons. Ligules membranous. Inflorescence a panicle of few (occasionally 1) spicate racemes, these sparingly branched below in a few species. Branch rachis and pedicels thick, flattened or rounded. Lower pair of spikelets of the branch awnless and infertile. Pediceled spikelet large, broad, staminate or neuter. Disarticulation in rachilla, the sessile spikelet falling attached to the associated pedicel and rachilla joint immediately above.

TYPE SPECIES: *Dichanthium nodosum* Willemet, now correctly known as *D. aristatum* (Poir.) C. E. Hubb.

A genus of about fifteen Asiatic, Australian and African species, none native to the New World.

KEY TO THE SPECIES

1. Inflorescence axis and branches just below spikelets finely pubescent. 1. *D. aristatum*
- 1a. Inflorescence axis and branches just below spikelets glabrous. 2. *D. annulatum*

1. *Dichanthium aristatum* (Poir.) C. E. Hubb. in Kew Bull. 1939: 654. 1939.

Basionym: *Andropogon aristatus* Poir. in Lam., Encycl. Méth. Bot. Suppl. 1: 585. 1910.

Type: Mauritius.

Syn.: *Dichanthium nodosum* Willemet in Ann. Bot. Usteri 18: 11. 1796. (Type: Mauritius.)

Perennial, developing stolons 2 m. or more long. Erect culms mostly 70-100 cm. tall. Culm nodes densely bearded with spreading hairs mostly 1 mm. or less long, often glabrate in age. Sheaths shorter than the internodes. Ligule a truncate, erose membrane about 1 mm. long. Blades 6-25 cm. long, 3-6 mm. broad, glabrous or sparsely hispid. Inflorescence well

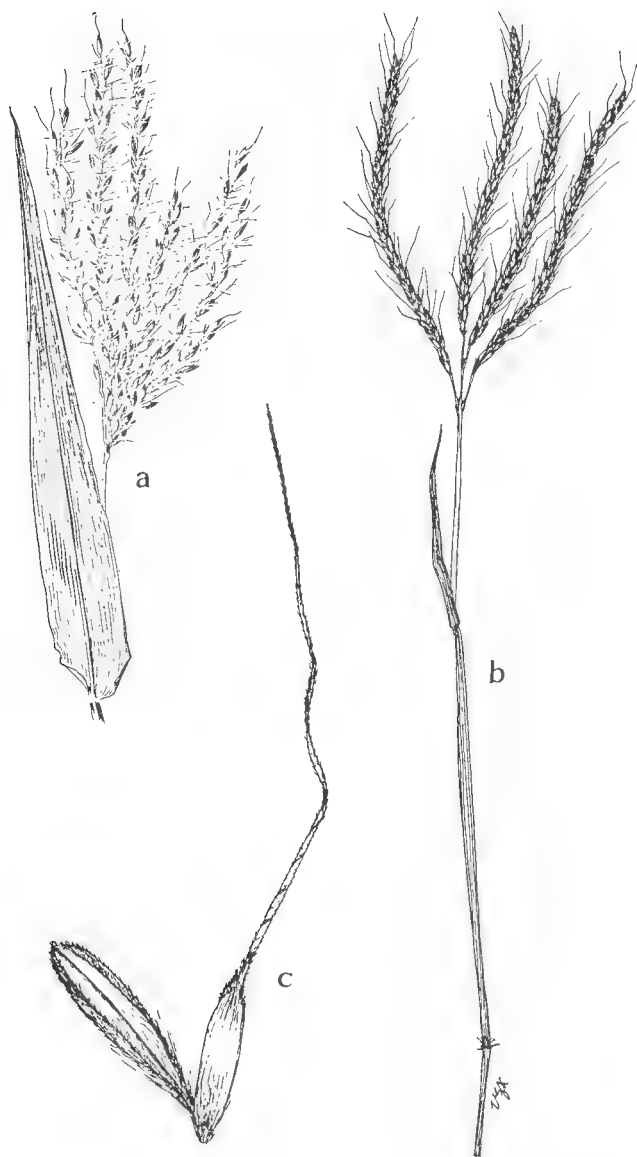


FIGURE 45. Poaceae. a, *Ischaemum latifolium*, $\times 1$. b, c, *Dichanthium annulatum*: b, inflorescence, $\times 0.5$; c, spikelet, $\times 20$. (a, reprinted from Hitchcock, Manual of the grasses of the West Indies, p. 417, fig. 367. 1936; b, c, reprinted from Gould, Grasses of the Texas Coastal Bend, p. 18, fig. 3. 1965.)

exserted, with (2-)3-5(-8) spicate, erect or spreading branches, occasionally a raceme, at the culm apex. Branch rachis and pedicels slender, terete or slightly flattened, hispid with spreading hairs, infrequently villous. Spikelets 4-5 mm. long, closely imbricate on the rachis, the sessile and pediceled ones similar in general appearance but only the sessile one awned. First glume broad and rounded at apex, hairy at least on margins. Lemma of perfect floret with a twisted, twice-geniculate, brownish awn 1.5-2.5 cm. long.

GENERAL DISTRIBUTION: In the warmer regions of the Old World; introduced in the Americas.

DISTRIBUTION IN LESSER ANTILLES: Antigua, Nevis, Guadeloupe, St. Vincent, the Grenadines, Grenada, Barbados.

HABITAT: Open, disturbed soil of field borders, ditches and wasteplaces.

2. *Dichanthium annulatum* (Forssk.) Stapf in Prain, Fl. Trop. Afr. 9: 178. 1917.

Basionym: *Andropogon annulatus* Forssk., Fl. Aegypt.-Arab. 173. 1775.

Type: Egypt.

Syn.: *Andropogon annulatus* var. *subrepens* Hack. in Notizbl. Bot. Gart. Berlin 1: 327. 1897. (Type: Duss 3678, Guadeloupe (isotype, mo).)

Stoloniferous perennial, similar to *D. aristatum* but culm nodes bearded with hairs often 4-6 mm. long, panicle axis and internodes glabrous, and awns and inflorescence branches tending to be shorter.

GENERAL DISTRIBUTION: Widespread in the warmer regions of the Old World; introduced as a forage grass in the Americas.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe, St. Lucia.

HABITAT: Cultivated or otherwise disturbed soil of fields and wasteplaces.

Hitchcock relegated the name *Andropogon annulatus* var. *subrepens* Hack. to synonymy under *Andropogon caricosus* L. (*Dichanthium caricosum* (L.) Stapf) (Man. Grasses W. I. 387. 1936). Two isotypes of var. *subrepens* in the herbarium of the Missouri Botanical Garden have been examined: on the basis of Hitchcock's key (*ibid.*, p. 385), one would be referred to *Dichanthium caricosum* (single raceme or of 2 racemose branches), and the other, a more robust specimen, with 3-6 panicle branches, to *D. annulatum*. There is some question whether or not *D. caricosum* and *D. annulatum* actually are specifically distinct.

59. BOTHRIOCHLOA Kuntze

***Bothriochloa* Kuntze, Rev. Gen. Pl. 2: 762. 1891.**

FIGURE 46.

Tufted perennials and a few annuals, mostly with erect culms but a few with decumbent-spreading bases that root at the lower nodes. Ligule membranous. Blades flat, usually lanceolate or linear. Inflorescence a panicle

of few to numerous unbranched or little-branched branches, occasionally reduced to a single spicate raceme. Spikelets in pairs of one sessile and one pediceled, the pediceled one staminate or neuter, the sessile one with one perfect floret above and a reduced floret below. Disarticulation at base of sessile spikelet, the spikelet falling attached to the associated pedicel and rachis section. Pedicels and upper rachis joints with a central groove or broad membranous area. Sessile spikelet usually awned, more or less triangular in outline, with large firm glumes, the first dorsally flattened, the second with a rounded keel. Lemmas of upper and lower florets of sessile spikelet thin and membranous, the lemma of the perfect floret usually with a stout, geniculate and twisted awn. Pediceled spikelet well developed, in many species nearly as large as the sessile one.

TYPE SPECIES: *Bothriochloa anamitica* Kuntze.

Species about 25, widely distributed in both the Old and New Worlds.

KEY TO THE SPECIES

1. First glume of sessile spikelet with a large, deep glandular pit. 2
- 1a. First glume of sessile spikelet without a glandular pit. 3
2. Panicle axis shorter than the branches. 1. *B. pertusa*
- 2a. Panicle axis longer than the branches, the branches usually several to many. 4. *B. bladhii*
3. Pediceled spikelet much narrower and shorter than sessile spikelet; pedicels with a broad membranous central area; panicles usually with numerous (usually 10 or more) branches. 2. *B. saccharoides*
- 3a. Pediceled spikelet about as long and nearly as broad as sessile spikelet; pedicels with a narrow membranous central area. 4
4. Panicle axis shorter than the branches, the branches typically few. 3. *B. ischaemum*
- 4a. Panicle axis longer than the branches, the branches typically numerous. 4. *B. bladhii*

1. ***Bothriochloa pertusa* (L.) A. Camus** in Ann. Soc. Lyon n. ser. 76: 164. 1931.

Basionym: *Holcus pertusus* L., Mant. Alt. 301. 1771.

Type: India.

Syn.: *Andropogon pertusus* (L.) Willd., Sp. Pl. 4: 922. 1805.

Tufted perennial with culms mostly 20–60 cm. tall but often decumbent and stoloniferous at base and as much as 100 cm. long. Culm nodes bearded, glabrate in age. Ligule a short, ciliate membrane. Blades mostly 8–20 cm. long and 2–5 mm. broad, usually sparsely hirsute, often with papilla-based hairs. Panicles 2–7 cm. long, usually with 2–7 loosely erect-spreading, usually simple branches. Branch rachis and pedicels ciliate on margins and, at least at tips, with a dark-colored medial groove. Sessile spikelets 3–4 mm. long, narrowly oval, acute at apex. First glume of sessile spikelet hairy below middle, with a large glandular pit. Pediceled spikelets neuter,

as long as the sessile one but narrower, the first glume with or without a glandular pit, occasionally with 2 pits.

GENERAL DISTRIBUTION: Warmer regions of Africa, India and China; introduced in the Americas.

DISTRIBUTION IN LESSER ANTILLES: Anguilla, Antigua, Nevis, Dominica, St. Lucia, Grenada, Barbados.

HABITAT: Open grassy areas, often in disturbed sites.

2. *Bothriochloa saccharoides* (Sw.) Rydb. in Brittonia 1: 81. 1931.

Basionym: *Andropogon saccharoides* Sw., Prodr. 26. 1788.

Type: Jamaica.

Perennial with stiffly erect culms in small clumps. Culms mostly 30-70 cm. tall, usually with bearded nodes but occasionally glabrous. Ligule a membrane 1.0-1.5 mm. long. Blades glabrous or more commonly hispid with papilla-based hairs on the adaxial surface near the base, mostly 8-15 cm. long and 2-4(-5) mm. broad. Panicles 6-10(rarely to 13) cm. long, with several to numerous erect-spreading spicate branches usually shorter than the common axis. Lower panicle branches usually rebranched near base, the upper ones simple. Pedicels and branch rachis soft-hairy, with a broad membranous central area. Sessile spikelets 3.8-4.6 mm. long, hairy at base. Awn of lemma of perfect floret 8-18 mm. long. Pediceled spikelet less than half as broad as the sessile one, 3-4 mm. long.

GENERAL DISTRIBUTION: Southern North America and the Antilles south to Argentina.

DISTRIBUTION IN LESSER ANTILLES: Antigua, St. Kitts, Guadeloupe, Dominica.

HABITAT: On grassy slopes at the higher elevations.

Hitchcock (Man. Grasses W. I. 400. 1936) reported West Indies plants of *Bothriochloa* (*Andropogon*) *saccharoides* to have culms reaching 150 cm. tall with panicles up to 15 cm. long. It is possible that two distinct taxa are involved. The present treatment is based on the moderately tall plants of the Lesser Antilles with panicles infrequently over 10 cm. long.

3. *Bothriochloa ischaemum* (L.) Keng in Contr. Biol. Lab. Sci. China Bot. Sci. 10: 201. 1936.

Basionym: *Andropogon ischaemum* L., Sp. Pl. 1047. 1753.

Type: Europe.

Tufted perennial with slender, erect culms 30-50 cm. tall or culms decumbent and trailing and much longer. Culm nodes bearded with short hairs. Sheaths glabrous. Ligule a truncate membrane usually 1 mm. or less long. Blades linear, mostly 2-4 mm. broad and 4-20 cm. long, usually hispid with long, stiff, papilla-based hairs in vicinity of ligule. Inflorescence

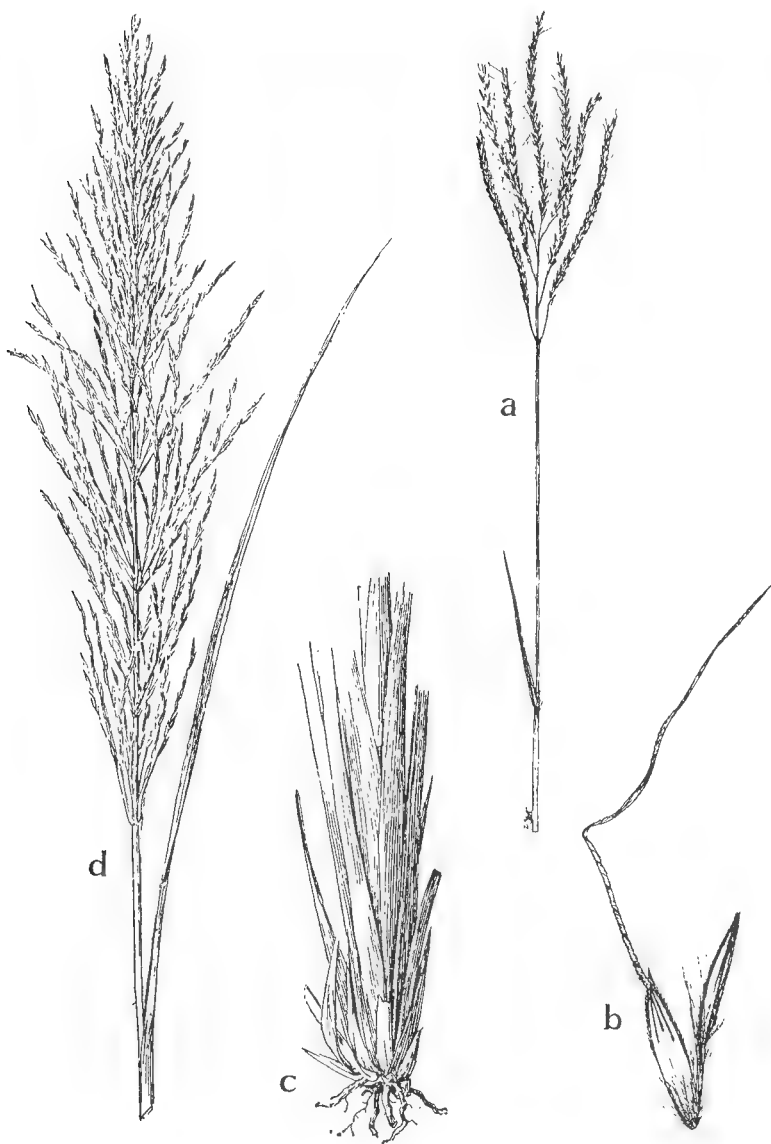


FIGURE 46. Poaceae. a, b, *Bothriochloa ischaemum*: a, inflorescence, $\times 0.3$; b, spikelet pair, $\times 3$. c, d, *Vetiveria zizanioides*: c, culm base, $\times 0.5$; d, inflorescence, $\times 0.5$. (Reprinted from Gould, Grasses of the Texas Coastal Bend, p. 21, fig. 9a, b. 1965; c, d, reprinted from Hitchcock, Manual of the grasses of the United States, p. 771, fig. 1175. 1951.)

usually 4-10 cm. long and with 2(occasionally 1)-8 branches 3-9 cm. long, these usually simple, rarely rebranched. Branch rachis and pedicels ciliate on margins at least, the upper internodes and pedicels with a narrow, medial groove. Sessile spikelet 3.0-4.5 mm. long, narrowly ovate. First glume usually hairy below middle, glandless, rarely with a glandular pit or depression on a few spikelets (probably the result of hybridization with *B. pertusa*). Pediceled spikelet awnless, usually about as long as the sessile one and only slightly narrower.

GENERAL DISTRIBUTION: An Asiatic species now widely introduced in the warmer parts of the world, frequent in southeastern United States and northern Mexico as a roadside grass.

DISTRIBUTION IN LESSER ANTILLES: Anguilla, Antigua.

HABITAT: Originally introduced in the Americas as a pasturegrass, *B. ischaemum* is now widespread as a casual roadside, ditchbank, wasteland grass.

In 1975, Gould (The Grasses of Texas, 602, 604) referred the Texan plants to *B. ischaemum* (L.) Keng var. *songarica* (Rupr.) Celerier & Harlan (in Jour. Linn. Soc. London 55: 758. 1958). Further investigations are necessary to determine if the Lesser Antillean plants are of the typical variety or var. *songarica*.

4. *Bothriochloa bladhii* (Retz.) S. T. Blake in Proc. Roy. Soc. Queensland 80(6): 62, 63. 1969.

Basionym: *Andropogon bladhii* Retz., Obs. Bot. 2: 27. 1781.

Type: "In China lectum oumaliis misit bonorat Bladh."

Syn.: *Andropogon intermedius* R. Br., Prodr. Fl. Nov. Holl. 1: 202. 1810.

Bothriochloa intermedia (R. Br.) A. Camus in Ann. Linn. Soc. n. s. 76: 164. 1931.

Cespitose perennial, not developing rhizomes or stolons. Culms often stout, 50-100 cm. tall. Culm nodes usually bearded with appressed hairs. Sheaths rounded, glabrous. Ligule a short membrane, becoming lacerate in age. Blades glabrous except for a few hairs above the ligule, linear, 3-6(-8) mm. broad, attenuate, the lower ones often 20-30 cm. long. Panicles 8-15 cm. long, with numerous, erect-spreading branches mostly 4-7 cm. long, these simple or the lower ones sparingly rebranched. Pedicels inconspicuously ciliate on margins, with a narrow medial groove. Sessile spikelets mostly 3.5-4.0 mm. long. First glume glabrous or scabrous below middle, pointed at apex, with or without a glandular pit or depression on back at or above the middle. Lemma awn mostly 1.0-1.5 mm. long, geniculate and twisted below. Pediceled spikelet staminate, similar to the sessile one in size and shape but often slightly smaller.

GENERAL DISTRIBUTION: Native to tropical and subtropical Asia, Australia and islands of the Pacific; introduced in the Antilles.

DISTRIBUTION IN LESSER ANTILLES: The Grenadines, Barbados.

HABITAT: Introduced in North America and the Antilles as a potential forage grass, persisting as a weed of ditch banks, field borders and little-disturbed waste areas.

60. VETIVERIA Bory de Saint Vincent

Vetiveria Bory in Lem.-Lisanc., in Bull. Soc. Philom. 1822: 43. 1822.

FIGURE 46.

Tall, coarse, leafy perennial with aromatic roots. Leaves glabrous, the sheaths laterally compressed and keeled. Ligule a fringe of short hairs. Blades firm, elongate, often folded. Panicles large, loosely contracted, with numerous whorls of erect-spreading branches 4-7 cm. long. Disarticulation in the branch rachis. Spikelets awnless, in pairs of one sessile and perfect and one pediceled and staminate, the spikelets all of about the same size. Glumes of both sessile and pediceled spikelets firm but not hard or thick, the lemmas thin, membranous and hyaline.

TYPE SPECIES: *Vetiveria odoratissima* Bory, now correctly known as *V. zizanioides* (L.) Nash, based on *Phalaris zizanioides* L.

A monotypic genus, the single species widely distributed throughout the warm regions of the world and often cultivated.

1. *Vetiveria zizanioides* (L.) Nash in Small, Fl. Southeast. U. S. 67. 1903.

Basionym: *Phalaris zizanioides* L., Mant. Pl. 2: 183. 1771.

Type: India.

Syn.: *Chrysopogon zizanioides* (L.) Roberty, Monogr. Syst. Andropogonee, 1960; Fournet, Fl. Guadeloupe Martinique 169. 1978.

Perennial with culms 1-2 m. or more tall, usually in dense clumps. Ligule a fringe of short hairs. Blades linear, often laterally folded on a strong midnerve, mostly 4-12 mm. broad, finely serrate-scabrous on the margins. Panicles mostly 20-35 cm. long, with many branches in several whorls. Spikelets awnless, 4-5 mm. long, the pediceled ones often slightly shorter.

GENERAL DISTRIBUTION: Throughout the warmer regions of both hemispheres.

DISTRIBUTION IN LESSER ANTILLES: St. Martin, Antigua, St. Eustatius, St. Kitts, Montserrat, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Grenada, Barbados.

HABITAT: Widely cultivated for its aromatic roots and growing as an escape.

61. ANDROPOGON Linnaeus

Andropogon L., Sp. Pl. 1045. 1753.

FIGURE 47

Cespitose perennials with stiffly erect culms, rounded or flattened and keeled sheaths, membranous ligules and flat or folded blades. Plants often

with culms much-branched above into numerous small panicles with 2-few racemose branches. Spikelets in pairs of one sessile and perfect and one pediceled and staminate or neuter, sometimes completely reduced. Disarticulation in rachis, the spikelets falling attached to a rachis joint and one or 2 pedicels. Sessile spikelets 2-flowered, the lower floret neuter. Glumes firm, large, awnless. Lemmas of upper and lower florets thin and hyaline, the upper floret awned or awnless.

TYPE SPECIES: *Andropogon distachyus* L.

As presently interpreted, a relatively large genus of primarily tropical and subtropical grasses, with about 25 species in North America.

KEY TO THE SPECIES

1. Spikelets, at least the sessile ones, awned. 1. *A. glomeratus*
- 1a. Spikelets awnless. 2
2. Plants mostly 1 m. or more tall; at least some of the pediceled spikelets terminating panicle branches much larger than the sessile ones; inflorescences numerous, typically forming a large, bushy cluster. 2. *A. bicornis*
- 2a. Plants infrequently as much as 1 m. tall; pediceled spikelets all greatly reduced, not infrequently minute or absent; inflorescences few to several, not forming a large, bushy cluster. 3. *A. leucostachyus*

1. *Andropogon glomeratus* (Walt.) B.S.P., Prel. Cat. N. Y. 67. 1888.

Basionym: *Cinna glomerata* Walt., Fl. Carol. 59. 1788.

Type: South Carolina.

Stout perennial with culms in dense clumps from a nonrhizomatous base. Culms mostly 75-150 cm. tall. Sheaths glabrous, occasionally hispid along margins and dorsally near collar, the lower sheaths overlapping, broad, compressed laterally and sharply keeled on midnerve. Ligule a stiff membrane ciliate with hairs to 2 mm. long. Blades elongate, 2.5-6.0(-8.0) mm. broad, usually much narrower than sheaths. Flowering culms broomlike, profusely branched and rebranched, the ultimate branches crowded and reduced in size. Uppermost branchlets silky-villous at least below nodes. Sheaths of terminal branchlets narrow and reduced, typically reddish-brown or bronze-colored. Inflorescence branches usually 2, each 1.5-3.0 cm. long, slightly shorter than the subtending sheath and partially enclosed by it. Branch rachis delicate, villous with long, silvery hairs. Sessile spikelets 3.0-4.5 mm. long, glabrous. Awn of lemma 1-2 cm. long, straight or undulate. Pedicel villous with long hairs, the pediceled spikelet vestigial or completely absent.

GENERAL DISTRIBUTION: Southern United States south through Mexico, Central America and the Antilles to northern South America.

DISTRIBUTION IN LESSER ANTILLES: St. Martin, Antigua, Saba, St. Kitts, Nevis, Montserrat, Guadeloupe, Martinique, St. Lucia, Grenada.

HABITAT: Moist or wet ground, usually along swales and marshes.

2. *Andropogon bicornis* L., Sp. Pl. 1046. 1753.

Type: "Brazil, Jamaica."

Coarse perennial with culms mostly 1.0-2.5 m. tall, in dense clumps from a hard, knotty base. Sheaths rounded on back, glabrous. Blades long, narrow, usually folded, 2-5 mm. broad, usually narrower than the sheaths. Flowering culms with numerous branches terminating a broomlike mass of small, bracteate inflorescences, these mostly 2-4 cm. long and with 2-4 branches. Branch rachis and pedicels slender, with soft, silvery or tawny, spreading hairs 5-7 mm. or more long. Spikelets awnless, the sessile ones about 3 mm. long, the pediceled ones greatly reduced except for the terminal 1 or 2 on the branch which often are as large as or larger than the sessile ones.

GENERAL DISTRIBUTION: Southern Mexico and the Antilles south to Brazil.

DISTRIBUTION IN LESSER ANTILLES: St. Martin, Antigua, Saba, St. Kitts, Montserrat, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Grenada, Barbados.

HABITAT: Low, moist areas, often in disturbed soil and on roadbanks.

3. *Andropogon leucostachyus* H.B.K., Nov. Gen. Sp. 1: 187. 1816.

Type: Venezuela.

Tufted perennial with culms mostly 30-70 cm. tall, occasionally taller. Culm nodes often bearded. Leaves mostly in a basal cluster, the sheaths and blades narrow, keeled and laterally flattened. Ligule a minute membranous rim. Basal blades long, 1-3 mm. broad but usually folded for most of their length. Inflorescences produced at the upper 1-several nodes, commonly rather loosely spaced and never in a much-branched, congested or broomlike cluster. Inflorescence well exserted or partially included in subtending sheath, mostly 3-5 cm. long and with 2-4 branches. Sessile spikelets 2.5-3.5 mm. long, awnless. Pediceled spikelets greatly reduced or absent. Branch rachis and pedicels with long, spreading, silky hairs as much as 1 cm. long.

GENERAL DISTRIBUTION: Antilles, southern Mexico and south to Brazil.

DISTRIBUTION IN LESSER ANTILLES: Currently without specific record from the Lesser Antilles, but its occurrence is probable.

HABITAT: Open, grassy slopes.

62. *DIECTOMIS* Humboldt, Bonpland & Kunth

Diectomis H.B.K., Nov. Gen. Sp. 1: 193, *pl.* 64. 1816.

FIGURE 47.

Annuals with erect or geniculate-spreading culms and narrow, flat blades. Inflorescence a spicate raceme closely subtended by a narrow bract on a long, slender peduncle. Disarticulation in the rachis. Spikelets in pairs

of one sessile and perfect and one pediceled and sterile, the pediceled spikelet with a greatly inflated, many-nerved lower glume and a nerveless, hyaline upper glume. Lower glume of both sessile and pediceled spikelets with a straight, slender awn, the lemma of the sessile spikelet with a long, stout, geniculate awn.

TYPE SPECIES: *Diectomis fastigiata* (Sw.) H.B.K., based on *Andropogon fastigiatus* Swartz.

Species 2, in the tropical and subtropical regions of the New World.

1. *Diectomis fastigiata* (Sw.) H.B.K., Nov. Gen. Sp. 1: 193, pl. 64: 1816.

Basionym: *Andropogon fastigiatus* Sw., Prodr. 26. 1788.

Type: Jamaica.

Slender, weak-stemmed, glabrous annual with culms from 50 to over 100 cm. tall. Sheaths rounded, with the apex continued above as a divided or undivided auriculate structure as much as 2 cm. long, the nerves of the sheath continued into the auricle, the lateral nerves of the sheath continuing upward into the blade. Inflorescence 2-6 cm. long, disarticulating at the nodes of the rachis. Rachis and pedicels thick but flattened, ciliate to villous on margins with long white hairs. Glumes thin, membranous, glabrous. First glume of sessile spikelet narrow, 2-keeled, the second glume boat-shaped, laterally compressed, 4-5 mm. long. Lemma of sessile spikelet hyaline, with a stout, geniculate awn mostly 4-5 mm. long, the lower section dark brown and twisted. Pediceled spikelet reduced to 2 glumes, the first broad, thin, many-nerved, 7-8 mm. long, the second hyaline, nerveless; both glumes with a short straight awn, the first glume awned from between slender, setaceous teeth.

GENERAL DISTRIBUTION: Islands of the Antilles, Mexico to Brazil.

DISTRIBUTION IN LESSER ANTILLES: Dominica and Grenada.

HABITAT: A weed of open ground, frequent on disturbed soil along fields and roadways.

63. SCHIZACHYRIUM Nees von Esenbeck

Schizachyrium Nees, Agrost. Bras. 331. 1829.

Annuals and perennials, cespitose or with stolons and occasionally rhizomes. Leaves with rounded sheaths, membranous ligules, and narrow, flat, folded or involute blades. Flowering culms branching at the upper 2-several nodes, each branch terminating in a short, slender, spicate raceme. Disarticulation in the rachis just below the sessile spikelet, the sessile spikelet falling attached to the pedicel and a section of the rachis. Rachis joint, at point of disarticulation, with a deep, cup-shaped, irregularly lobed apex. Sessile spikelet perfect, with large, firm glumes and membranous lemmas. Lemma of lower floret entire, lemma of upper (perfect) floret cleft



FIGURE 47. Poaceae. a, *Andropogon glomeratus*, inflorescence, $\times 1$. b, *Diectomis fastigiata*, $\times 0.5$. c, *Cymbopogon citratus*, branchlet, $\times 1$. (a, reprinted from Gould, Grasses of the Texas Coastal Bend, p. 21, fig. 6. 1965; b, c, reprinted from Hitchcock, Manual of the grasses of the West Indies, p. 403, fig. 357, p. 404, fig. 358. 1936.)

$\frac{3}{4}$ – $\frac{7}{8}$ of the way to the base, with a geniculate awn in the notch. Pediceled spikelets staminate or neuter, usually smaller than the sessile ones.

TYPE SPECIES: *Schizachyrium condensatum* (H.B.K.) Nees, based on *Andropogon condensatus* H.B.K.

Species about 30, mostly in the warmer parts of both hemispheres but one, *S. scoparium* (Michx.) Nash, widespread in grassland regions of central North America from Mexico to Canada.

KEY TO THE SPECIES

- 1. Spikelets awned; racemes congested or not. 2
- 1a. Spikelets awnless; racemes relatively few, not congested. ... 3. *S. salzmannii*
- 2. Blades flat; racemes numerous, usually densely crowded and congested in a broomlike cluster. 1. *S. microstachyum*
- 2a. Blades involute; racemes relatively few, not crowded or congested in broomlike clusters. 2. *S. gracile*

1. *Schizachyrium microstachyum* (Desv.) Roseng., Arr. & Izag. in Bol. Fac. Agr. Montev. 103: 35. 1968.

Basionym: *Andropogon microstachyus* Desv. ex Hamilt., Prodr. 8. 1825.

Type: Antilles.

Cespitose perennial with stout, clustered culms 40–150 cm. tall. Herbage glabrous. Sheaths, at least the lowermost, keeled and laterally compressed. Blades flat or folded, mostly 10–20 cm. long and 5–10 mm. broad. Racemes typically crowded and congested on the upper 12–40 cm. of the flowering branch, the flower cluster always elongate but occasionally not densely flowered. Rachis of raceme slender, flattened and flexuous, conspicuously zigzag at maturity, ciliate with long hairs on the margins, mostly 2.0–3.5 cm. long. Sessile spikelets mostly 5.5–6.0 mm. long, with a delicate, geniculate and twisted lemma awn 8–12 mm. long. Pediceled spikelet absent or greatly reduced, when present then usually with a short, straight awn.

GENERAL DISTRIBUTION: Eastern Mexico and the Antilles south to southern South America.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Grenada.

HABITAT: Low, moist areas of low fertility, often in large stands.

Schizachyrium microstachyum was treated by Hitchcock (Man. Grasses W. I. 388. 1936) as a synonym of *Andropogon condensatus* H.B.K. (*Schizachyrium condensatum* (H.B.K.) Nees). South American authors now treat these two species as distinct, with *S. condensatum* having an overlapping but more southerly range. The cluster of racemes at the branch tips in *S. condensatum* is short and capitate, mostly not more than 5 cm. long.

2. *Schizachyrium gracile* (Spreng.) Nash in Small, Fl. Southeast. U. S. 60. 1903.

Basionym: *Andropogon gracilis* Spreng., Syst. Veg. 1: 284. 1825.

Type: Hispaniola.

Syn.: *Andropogon juncifolius* Desv. ex Hamilt., Prodr. 9. 1825. (Type locality: Santa Crus.)

Erect perennial with slender, wiry culms mostly 20-100 cm. tall. Sheaths rounded, broader than the involute blades, with stiff short auricles on either side at the apex, these often with a few long hairs. Blades elongate, involute, 1-2 mm. broad. Racemes few, on long, bracteate peduncles, mostly 2-5 cm. long, with a slender, villous, conspicuously zigzag rachis. Spikelets 4.5-5.0 mm. long, the sessile spikelet with an indistinctly geniculate and twisted lemma awn 1-2 cm. long.

GENERAL DISTRIBUTION: Southern Florida and the Antilles.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe, *Duss* 2719.

HABITAT: Open, rocky, well-drained slopes.

3. *Schizachyrium salzmannii* (Trin.) Nash, N. Am. Fl. 17: 104. 1912.

Basionym: *Rottboellia salzmannii* Trin. ex Steud., Syn. Pl. Glum. 1: 361. 1854.

Type: Brazil.

Syn.: *Andropogon salzmannii* (Trin.) Hack., in Fedde Repert. Sp. Nov. 6: 341. 1909.

Culms solitary or in small clumps, slender, erect, 30-75 cm. tall. Sheaths laterally compressed and keeled, glabrous. Ligule a short membrane. Blades linear, flexuous, flat or folded, mostly 7-15 cm. long and 2-3 mm. broad, the blades of the lower leaves usually with few to many long, stiff hairs on the adaxial surface above the ligule. Raceme glabrous or with a few short hairs at the nodes, stiff and straight, 5-12 cm. long, with a thick rachis and thick, appressed, glabrous pedicels. Spikelets awnless, the sessile and pediceled spikelets both 5-7 mm. long but the pediceled spikelet narrower and often more reduced.

GENERAL DISTRIBUTION: Southern Mexico to Brazil.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe, Martinique.

HABITAT: On sandy hills.

64. CYMBOPOGON Sprengel

Cymbopogon Spreng., Pl. Pugill. 2: 14. 1815.

FIGURE 47.

Coarse, cespitose, often aromatic perennials with long, flat blades. Ligule a firm, fimbriate membrane. Spikelets numerous in small, bracteate panicles, these in elongate, much-branched, decompounded, congested flower

clusters, the individual panicles with 2 short, widely spreading branches subtended by sheathing spatheoles. Spikelets in pairs, of one or both panicle branches staminate or neuter and awnless, otherwise the sessile spikelet perfect and awned, and the pediceled spikelet staminate or neuter and awnless. Branch rachis readily disarticulating, the joints falling attached to the sessile spikelet. Tips of rachis and pedicel joints usually enlarged and cupped or auricled. First glume of sessile spikelet firm, chartaceous, slightly larger than the thin, often membranous second glume. Lemmas and paleas membranous, hyaline, the paleas often absent.

TYPE SPECIES: *Cymbopogon schoenanthus* (L.) Spreng., based on *Andropogon schoenanthus* L.

An Old World tropical genus of about 30 species. The widely cultivated *Cymbopogon citratus* is the lemon grass of commerce.

1. ***Cymbopogon citratus*** (DC. ex Nees) Stapf in Kew Bull. Misc. Inf. 1906: 322. 1906.

Basionym: *Andropogon citratus* DC., Cat. Hort. Monsp. 78. 1813 (name only); DC. ex Nees in Allgem. Gartenz. 3: 267. 1835.

Type: Cultivated, source not indicated.

Syn.: *Cymbopogon nardus* (L.) Rendle emend Roberty, subvar. *citratus* Roberty, Monogr. Syst. Andropogonee, 1960; Fournet, Fl. Guadeloupe Martinique 170. 1978.

Culms in dense clumps, to 2 m. or more tall. Sheaths pubescent on the sides of the collar. Ligules to 4 mm. long. Blades to 1 m. long, 5–15 mm. broad, with a strong yellowish midrib. Flowering portion of culm 25–60 cm. long, the lateral floriferous branches appressed, spreading at tips, up to 15 cm. or more long, produced at widely spaced nodes of the main axis. Rachis joints and pedicels conspicuously ciliate on margins. Spikelets 4.0–4.5 mm. long, the sessile spikelet with a delicate, geniculate and twisted awn 7–10 mm. long from a hyaline, minutely notched apex. Outer glume of sessile spikelet notched and more or less winged at apex.

GENERAL DISTRIBUTION: Native to the Old World; widely cultivated throughout the warmer parts of both hemispheres.

DISTRIBUTION IN LESSER ANTILLES: St. Lucia, St. Vincent, Barbados.

HABITAT: Cultivated, occasionally growing as an escape.

65. **HYPARRHENIA** Andersson ex Stapf

Hyparrhenia Anderss. ex Stapf in Prain, Fl. Trop. Afr. 9: 291. 1918.

FIGURE 48.

Mostly tall, nonaromatic perennials with long, narrow, flat blades and inflorescences in small, bracteolate, once-branched panicles on slender, moderately decompounded branches of the main culm axis. Inflorescence a short panicle with 2 (paired) branches, partially enclosed in a spatulate



FIGURE 48. Poaceae. a, *Hyparrhenia rufa*, branchlet, $\times 1$. b, *Themeda arguens*, $\times 0.5$. (Reprinted from Hitchcock, Manual of the grasses of the West Indies, p. 405, fig. 359, p. 422, fig. 372. 1936.)

sheath on a slender branch or peduncle. Spikelets mostly in pairs of one sessile and one pediceled, the sessile spikelets of the upper one to several rachilla joints bisexual and awned, the lower one or more pairs and all pediceled spikelets staminate or neuter and awnless. Rachis joints and pedicels densely ciliate on margins. First glume of sessile spikelet firm, chartaceous, the second glume and lemmas membranous, the paleas usually absent. Lemma of perfect floret with a stout, geniculate and twisted awn.

TYPE SPECIES: *Hyparrhenia pseudocymbaria* (Steud.) Stapf, based on *Anthistiria pseudocymbaria* Steud.

Species about 75, mostly native to the tropical and subtropical regions of Africa and Asia.

1. *Hyparrhenia rufa* (Nees) Stapf in Prain, Fl. Trop. Afr. 9: 304. 1918.

Basionym: *Trachypogon rufus* Nees, Agrost. Bras. 345. 1829.

Type: Brazil.

Tufted perennial with culms mostly 80 cm. to over 2 m. tall. Sheaths rounded, glabrous or the lower ones sparsely hairy on the back and ciliate-pubescent on the margins. Ligules firm, reddish-brown, 2-5 mm. long. Blades elongate, glabrous, mostly 3-10 mm. broad, scabrous-serrate on margins. Panicles mostly 3-5 cm. long, each branch with usually 4-7 bisexual (awned) spikelets. Spikelets all about the same size, mostly 3.0-4.5 mm. long. First glume with stiff, reddish-brown hairs on back, the second glume slightly shorter and glabrous. Awn of lemma of perfect floret 15-25 mm. long, twice-geniculate, twisted and pubescent below and with reddish hairs.

GENERAL DISTRIBUTION: Introduced into the Americas from the Old World and occasional as a cultivated pasturegrass or weedy escape in many areas.

DISTRIBUTION IN LESSER ANTILLES: St. Kitts, Guadeloupe, Martinique.

HABITAT: A cultivated pasturegrass that occasionally is present as a weed of roadsides and wasteplaces.

66. THEMEDA Forsskål

Themeda Forssk., Fl. Aegypt.-Arab. 178. 1775.

FIGURE 48.

Tufted annuals and perennials with flat, linear blades. Ligule membranous. Inflorescence a few-flowered raceme in a sheathing spatheole, the racemes single or clustered on slender, flexuous peduncles at the upper culm nodes. Raceme with 2 pairs of sessile homogamous spikelets more or less verticiled at the base and enclosing or surrounding 1-4 sessile, bisexual, awned spikelets and a like number of pediceled, staminate or neuter awnless spikelets. Homogamous spikelets persistent. Sessile spikelet or spikelets firm, terete, two-flowered, disarticulating separately. Upper floret

of sessile spikelet bisexual, with an awned lemma, the lower floret reduced to a hyaline lemma. Pediceled spikelets staminate or neuter, awnless.

TYPE SPECIES: *Themeda triandra* Forssk.

Species about ten, native to the warmer regions of the Old World.

KEY TO THE SPECIES

1. Glumes of sessile, homogamous (neuter) spikelets and often the subtending bracteoles with a few stiff, bristly papilla-based hairs, the papillae usually extremely large. 1. *T. quadrivalvis*
- 1a. Glumes of sessile, homogamous spikelets and the subtending bracteoles villous with slender hairs, these commonly with minute papillae at base. 2. *T. arguens*

1. *Themeda quadrivalvis* (L.) Kuntze, Rev. Gen. Pl. 2: 794. 1891.

Basionym: *Andropogon quadrivalvis* L., Syst. Veg. ed. 13. 758. 1774.

Type: India.

Syn.: *Themeda ciliata* Hack. ex DC., Monogr. Phan. 6: 664. 1889, based on *A. quadrivalvis* L.

Coarse, leafy annuals with culms from less than 0.5–1.5 m. tall, in small to large clumps. Ligule a fimbriate membrane mostly 1.5–3.0 mm. long. Blades narrow, linear, flat or folded, usually glabrous or with a few stiff cilia, mostly 4–10 mm. broad. Flowering shoots with few to numerous fascicled flower clusters, these subtended by variously reduced bracts and bracteoles, these glabrous except for the relatively few stiff papilla-based hairs. Grain terete, dark brown at maturity, 5–7 mm. long, with a stout geniculate awn mostly 3–6 cm. long. Glumes scabrous at the pointed apex, hairy with stiff, brownish hairs on callus.

GENERAL DISTRIBUTION: Native to India and the East Indies; introduced in the Antilles.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe, Martinique, Barbados.

HABITAT: Occasional as an introduction in cultivated fields and as an escape on roadsides and in wasteplaces.

2. *Themeda arguens* (L.) Hack. ex DC., Monogr. Phan. 6: 657. 1889.

Basionym: *Stipa arguens* L., Sp. Pl. ed. 2. 117. 1762.

Type: India.

Similar in general to *T. quadrivalvis* but sheaths often hispid and blades more or less hairy near the base on one or both surfaces. Grains mostly 6–8 mm. long, the stout lemma awn to 7 cm. or more long.

GENERAL DISTRIBUTION: Native to India; an occasional introduction elsewhere in the tropics.

DISTRIBUTION IN LESSER ANTILLES: Barbados, Ballou in 1927 (us).

HABITAT: Introduced in the Antilles, now growing in fields and as an escape on roadsides and wasteplaces.

67. POLYTRIAS Hackel

Polytrias Hack., in Nat. Pflanzenfam. 2(2): 24. 1887.

Low perennial with short, flat blades. Inflorescence a short, few-flowered, spicate raceme. Spikelets in threes on a disarticulating rachis, 2 sessile and one pediceled, all bisexual or the pediceled one reduced. Spikelets with 2 well-developed glumes and a single perfect floret, this represented by a hyaline, awned lemma and the flower or fruit.

TYPE SPECIES: *Pollinia praemorsa* Nees, now correctly known as *Polytrias praemorsa* (Nees) Hack.

A monotypic genus, the single species native to the South Pacific area.

1. *Polytrias praemorsa* (Nees) Hack. in DC., Monogr. Phan. 6: 189. 1889.

Basionym: *Pollinia praemorsa* Nees ex Hook. in Jour. Bot. 2: 98. 1850.

Type: Java.

Perennial with flowering shoots mostly 10–30 cm. tall from decumbent, creeping, much-branched culms and short, flat, usually hispid blades 2–4 mm. broad. Peduncles ranging from partially included in to well exerted above the uppermost sheath. Racemes 2–6 cm. long, villous-pubescent with brownish hairs on glumes, rachis joints and pedicels. Spikelets 3.6–5.0 mm. long, with a membranous, truncate lower glume and a twisted and geniculate lemma awn 8–14 mm. long.

GENERAL DISTRIBUTION: Java, Malay Peninsula and the Philippines.

DISTRIBUTION IN LESSER ANTILLES: Grenada, *Broadway s.n.*, 25 Nov. 1904 (GH, NY); St. Vincent, *Gould 15142A*.

HABITAT: Open woods and grasslands; a rare introduction in the Antilles.

Polytrias praemorsa, collected at St. Georges on Grenada by Broadway in 1904, was not collected again in the Antilles until the recent (1977) collection of a single culm by the writer on Cumberland Road above Spring Village. On his specimen label, Broadway noted "a pretty meadow grass."

68. HETEROPOGON Persoon

Heteropogon Pers., Syn. Pl. 2: 533. 1807.

FIGURE 49.

Large, often coarse annuals and perennials with linear blades and unilateral spicate racemes. Ligule a fringed membrane. Spikelets in pairs of one sessile and bisexual and one pediceled and staminate or neuter but the lower few to several pairs both staminate or neuter. Sessile (bisexual) spikelets terete, with firm or hard, dark-colored glumes and a long, geniculate and twisted awn. Staminate or neuter spikelets with thin, broad,



FIGURE 49. Poaceae. a-c, *Heteropogon contortus*: a, culm base, $\times 0.5$; b, inflorescence, $\times 0.5$; c, fruiting spikelet, $\times 5$. (Reprinted from Hitchcock, Manual of the grasses of the United States, p. 780, fig. 1182. 1951.)

green, many-nerved glumes. Lemmas of the 2-flowered sessile spikelet reduced, membranous, nerveless, the upper one with a stout awn.

TYPE SPECIES: *Heteropogon glaber* Pers., synonymous with *Andropogon contortus* L. and now correctly known as *Heteropogon contortus* (L.) Beauv. ex Roem. & Schult.

A genus of about five species, in the tropics and subtropics of both hemispheres.

1. ***Heteropogon contortus*** (L.) Beauv. ex Roem. & Schult., Syst. Veg. 2: 836. 1817.

Basionym: *Andropogon contortus* L., Sp. Pl. 1045. 1753.

Type: India.

Cespitose perennial with erect, branching culms 20–80 cm. tall. Leaves glabrous except for a few long hairs at base of blade on adaxial surface. Sheaths laterally compressed and sharply keeled. Blades flat, elongate, 4–6(–10) mm. broad. Racemes on slender peduncles, these usually exserted at maturity. Racemes mostly 4–7 cm. long excluding the awns. Sessile spikelets 5–8 mm. long, with firm, dark-colored, brownish-hispid glumes and a slender, pointed, bearded callus. Awn of perfect floret commonly 5–12 cm. long, hispid, twisted and weakly twice-geniculate below.

GENERAL DISTRIBUTION: Widely distributed in tropical and subtropical regions of both hemispheres.

DISTRIBUTION IN LESSER ANTILLES: Antigua, St. Kitts, St. Eustatius, Montserrat, Guadeloupe, Martinique.

HABITAT: Grassy, open fields, mostly at low elevations.

69. **ROTTBOELLIA** Linné f.

Rottboellia L. f., Nov. Gram. Gen. 23, pl. 1. 1779, nom. cons.

Tall, coarse annuals with large, flat blades and numerous subcylindrical racemes at the upper branch tips. Spikelets awnless, in pairs at the nodes of a thickened, readily disarticulating rachis. Sessile spikelet 2-flowered, sunken in the internode. Pediceled spikelet as large as or slightly smaller than the sessile one, on a thick, broad, flattened pedicel, marginally fused to the rachis.

TYPE SPECIES: *Rottboellia exaltata* L. f.

A genus of three species, in the tropics of Asia and Africa; one species, *R. exaltata*, is introduced and frequent in the warmer regions of the New World.

1. ***Rottboellia exaltata*** L. f., Nov. Gram. Gen. 37, tab. 1. 1779; Suppl. Pl. 114. 1781.

Type: India.

Syn.: *Manisuris exaltata* (L. f.) Kuntze, Rev. Gen. Pl. 2: 779. 1891.

Coarse, branching annual with culms 0.8-2.0 m. or more tall and leaf sheaths hispid with stiff, nettlelike stinging hairs. Blades long, flat, mostly 8-20 mm. broad, with serrate-scabrous margins. Racemes 3-15 cm. long, the uppermost several spikelets progressively reduced and rudimentary at apex. Sessile spikelets broad and flattened, yellowish, the lower glume oblong, 3.5-5.0 mm. long, faintly many-nerved. Upper glume narrowly winged on keel above. Pediceled spikelet flattened, narrowly ovate, often greenish, with numerous fine nerves.

GENERAL DISTRIBUTION: Widespread in the tropics of the world, apparently introduced in the Americas.

DISTRIBUTION IN LESSER ANTILLES: St. Kitts, Nevis, Guadeloupe, Martinique, St. Lucia, St. Vincent, Grenada, Barbados.

HABITAT: A weed of moist ditches and wasteplaces.

70. HACKELOCHLOA Kuntze

Hackelochloa Kuntze, Rev. Gen. Pl. 2: 776. 1891.

FIGURE 50.

Annual with much-branched culms mostly 10-75 cm. tall but the lower flowering shoots often no more than 5 cm. long. Ligule a fringe of hairs 1-2 mm. long. Leaves commonly hispid with coarse, papilla-based hairs. Blades thin, short, mostly 4-8 mm. broad but the lower ones often 1 cm. or more broad. Racemes numerous, 1.0-2.5 cm. long, ultimately produced in the axils of all or nearly all culm nodes. Racemes bearing pairs of very dissimilar spikelets, the sessile, bisexual spikelets thick and rounded, coarsely rugose or rectangularly pitted, the pediceled spikelets staminate or sterile, usually consisting mainly of broad, thin, flat, ovate-lanceolate glumes. Pedicels short, fused to rachis on one side.

TYPE SPECIES: *Hackelochloa granularis* (L.) Kuntze, based on *Cenchrus granularis* L.

A monotypic genus distributed in tropical areas of the world.

1. *Hackelochloa granularis* (L.) Kuntze, Rev. Gen. Pl. 2: 776. 1891.

Basionym: *Cenchrus granularis* L., Mant. 2: 575. 1771.

Type: India.

Tufted, much-branched annual with slender, wiry, elongate culm internodes, these usually much longer than the sheaths. Racemes mostly in axillary clusters, these often progressively smaller near the tips of the main axis and short lateral branches. Base of raceme usually partially enclosed by the subtending leaf. Sessile (bisexual) spikelets about 1.5 mm. long, the pediceled (staminate or neuter) spikelets mostly 2-3 mm. long.



FIGURE 50. a-e, *Hackelochloa granularis*: a, culm base, $\times 0.5$; b, inflorescences, $\times 0.5$; c, single raceme, $\times 2$; d, e, two views of spikelets with rachis joint, $\times 5$. f, *Coix lacryma-jobi*, $\times 1$. (Reprinted from Hitchcock, Manual of the grasses of the United States, p. 788, fig. 1193, p. 789, fig. 1194. 1951.)

GENERAL DISTRIBUTION: Throughout the tropics of the world.

DISTRIBUTION IN LESSER ANTILLES: St. Martin, St. Kitts, Guadeloupe, Martinique, St. Vincent.

HABITAT: Sandy, open slopes or in partial shade; often weedy on disturbed sites.

71. COIX Linnaeus

Coix L., Sp. Pl. 972. 1753.

FIGURE 50.

Coarse, leafy, monoecious annuals and (?) perennials with thick culms and broad flat blades. Staminate spikelets subsessile in twos and threes on a slender, continuous rachis. Pistillate spikelets below the staminate, enclosed in hard, bony, beadlike involucre of modified bracts. Staminate spikelets 2-flowered, with thin, membranous glumes and hyaline lemmas and paleas. Pistillate spikelets 3 in each beadlike involucre, one pistillate and 2 neuter. Pistillate spikelets 1-flowered, with membranous glumes, hyaline below and firm at the pointed tips, and hyaline lemma and palea.

TYPE SPECIES: *Coix lacryma-jobi* L.

Species about four, in tropical and subtropical Asia; one species, *C. lacryma-jobi*, widely introduced in Africa and the Americas.

1. *Coix lacryma-jobi* L., Sp. Pl. 972. 1753.

Type: India.

Syn.: *Coix lacryma* L., Syst. Nat. ed. 10. 2: 1261. 1759.

Culms thick and succulent, much-branched, mostly 1.0–1.5 m. tall. Leaves glabrous, mostly 1.5–5.0 cm. broad and as much as 50 cm. long, often cordate at base. Staminate part of inflorescence 1.5–4.0 cm. long, with spikelets few to several, subsessile, crowded, mostly paired. Glumes of staminate spikelets membranous, faintly several-nerved, 7–12 mm. long. Beadlike pistillate involucre hard, shiny, white to grey or bluish, globose, 6–12 mm. long.

GENERAL DISTRIBUTION: Native to Asia but now widely distributed in tropical regions of the New World.

DISTRIBUTION IN LESSER ANTILLES: St. Martin, Antigua, St. Kitts, Montserrat, Guadeloupe, Dominica, Martinique, St. Lucia, Grenada, Barbados.

HABITAT: Low, moist areas, often weedy in ditches and other areas of disturbed soil.

72. TRIPSACUM Linnaeus

Tripsacum L., Syst. Nat. ed. 10. 2: 1261. 1759.

Monoecious perennials with tall culms often in dense clumps. Inflorescence a spicate raceme or panicle of spicate branches, with the pistillate

spikelets below the staminate on the same raceme or spicate panicle branch. Staminate spikelets 2-flowered, awnless, in pairs on one side of a continuous rachis. Pistillate spikelets subsessile, usually solitary, hard and bony, awnless, the glumes indurate, fused with the rachis and tightly enclosing the other spikelet parts. Lemmas of neuter and perfect florets of pistillate spikelets thin and hyaline. Staminate portion of inflorescence deciduous as a whole, the pistillate portion breaking up at the nodes into hard, shiny, beadlike, fruiting units.

TYPE SPECIES: *Coix dactyloides* L., now correctly known as *Tripsacum dactyloides* (L.) L.

A genus of about ten species distributed throughout the warmer parts of the Americas, several occurring in Mexico.

1. *Tripsacum latifolium* Hitchc. in Bot. Gaz. 41: 294. 1906.

Type: Guatemala. Dept. Alta Verapaz. Cubilquitz, *H. von Tuerckheim* 8333 (us).

Coarse perennial with glabrous culms to 4 m. or more tall. Blades typically 0.7-1.0 m. or more long, 2.5-7.0 cm. broad, sparsely pubescent on adaxial surface and glabrous below, the lower ones narrowing to a petiole-like base. Inflorescence a spicate raceme or more commonly a panicle with 2-7 spicate branches. Staminate spikelets 4-7 mm. long, both sessile or the upper one with a pedicel to 1 mm. long.

GENERAL DISTRIBUTION: Central America and the Antilles.

DISTRIBUTION IN LESSER ANTILLES: Reported by Hitchcock (1936) as cultivated for forage in Antigua.

HABITAT: Moist slopes, often in shaded areas.

The exact status of *Tripsacum latifolium* in the Antilles is not known. Hitchcock (Man. Grasses W. I. 424, 425. 1936) reported this species to have unbranched inflorescences, "all spikes solitary," and gave the range as "Hispaniola and Trinidad; Mexico and Central America." Swallen (in Fieldiana Bot. 24(II): 363. 1955) also reported the species to have "solitary racemes" and indicates the distribution to be British Honduras, Honduras and the "West Indies," not mentioning Mexico. In a recent publication, DeWet, Gray and Harlan (in Phytologia 33: 210. 1976) stated that *T. latifolium* has inflorescences with 3-7 branches, and only listed Central American locations in their distribution records.

73. ZEA Linnaeus

Zea L., Sp. Pl. 971. 1753.

FIGURE 51.

Tall monoecious annuals, one perennial, with thick, succulent culms mostly 1.5-4.0 m. tall. Ligule a short membrane. Blades broad and flat. Staminate spikelets 2-flowered, in an awnless panicle, this comprising the "tassel" of the cultivated corn. Pistillate inflorescences spicate, lateral,



FIGURE 51. Poaceae. a-e, *Zea mays*: a, pistillate inflorescence (ear), $\times 0.5$; b, two branches of staminate inflorescence (tassel), $\times 0.5$; c, pair of pistillate spikelets attached to rachis (cob) with mature grains, the second glumes showing, $\times 2$; d, single pistillate spikelet soon after flowering, $\times 4$; e, staminate spikelet, $\times 2$. (Reprinted from Hitchcock, Manual of the grasses of the United States, p. 795, fig. 1199. 1951.)

enclosed in numerous foliaceous sheaths, the spikelets unequally paired in few to several rows on a thickened, woody or corky axis (cob), the elongated styles (silk) long-exserted at apex as a mass of silky threads.

TYPE SPECIES: *Zea mays* L.

As interpreted by Reeves and Mangelsdorf (in. Am. Jour. Bot. 29: 815-817. 1942), a genus of three species; corn or maize, *Z. mays*, known only as a cultivated plant, and two Mexican species.

1. *Zea mays* L., Sp. Pl. 971. 1753.

Type: "America."

Leafy, succulent, monoecious annual with blades up to several cm. broad. Staminate spikelets in unequally pediceled pairs on spikelike branches of a terminal panicle. Glumes of staminate spikelets broad, thin, several-nerved, the lemmas and paleas thin and hyaline. Pistillate spikelets with 2 florets, the upper perfect, the lower usually reduced, occasionally perfect. Glumes of pistillate spikelets broad, thin, rounded at apex, much shorter than the mature caryopsis. Lemma of lower floret and lemma and palea of upper floret hyaline. Caryopsis large and thick, the "kernel" of cultivated corn.

GENERAL DISTRIBUTION: Native to the New World, now widespread as a cultivated plant in temperate and tropical regions of the world.

DISTRIBUTION IN LESSER ANTILLES: Antigua, Guadeloupe.

HABITAT: Cultivated fields and adjacent roadsides and wastelands. Undoubtedly not persisting without continued reestablishment from seed.

CYPERACEAE

by Tetsuo Koyama²

CYPERACEAE A. L. Jussieu, Gen. 26. 1789, nom. cons.

Perennial or annual herbs of grasslike or rushlike habit, rarely with elongated woody caudices. Culms generally trigonous and solid. Leaves radical and/or cauline, with linear or lance-elliptic blades, sheathing at base, occasionally reduced to subaphyllous sheaths; ligules usually hardly developed, but the abaxial side of leaf sheaths sometimes projected beyond the sheath orifice forming a tongue-like appendage (conraligule). Inflorescences various, mostly corymbose, paniculate, spicate, racemose or congested in head(s), subtended by leafy bracts, bearing 1 to numerous spikelets. Spikelets with few to many glumes imbricated or 2-ranked on a simple axis (rhachilla); all or some of these glumes bearing an axillary flower or at times an axillary, bisexual cymule, or rarely the rhachilla becoming

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determinate with a single terminal pistillate flower, and in this latter case the spikelet bearing 0-few small staminate partial spikelets at axils of some glumes in lieu of a single flower. Flowers hermaphroditic or unisexual, rarely dioecious, with perianth of 3 to many bristles or scaly segments, or perianth lacking. Stamens generally 1-3 to a flower. Pistil as a rule bi- or tri-carpellate; style elongated or short, 2- or 3 (rarely up to 8)-fid at apex (stigmas); ovary unilocular with a single anatropous ovule, maturing into an achene.

TYPE GENUS: *Cyperus* L.

A large monocotyledonous family comprised of over 3,800 species in about 48 genera, distributed throughout the world under all ecological conditions. The following seventeen genera, representing three subfamilies, occur in the Lesser Antilles.

Subfam. I. Cyperoideae.

Tribe 1. Scirpeae—*Fuirena*; *Schoenoplectus*; *Eleocharis*; *Fimbristylis*; *Bulbostylis*.

Tribe 2. Cyperae—*Cyperus*; *Pycnus*; *Mariscus*; *Kyllinga*; *Torulinum*; *Hemicarpha*.

Tribe 3. Cladieae—*Cladium*; *Machaerina*.

Tribe 4. Rhynchosporeae—*Rhynchospora*.

Subfam. II. Sclerioideae.

Tribe 5. Sclerieae—*Scleria*, *Diplacrum*.

Subfam. III. Caricoideae.

Tribe 6. Cariceae—*Carex*.

(Subfam. Mapanioideae—not represented in the Lesser Antilles.)

KEY TO THE GENERA

1. All or at least fruit-bearing flowers bisexual. 2
- 1a. Flowers unisexual. 15
2. Spikelets several- to many-flowered (except in *Hemicarpha*, in which spikelets are 1-flowered); all flowers as a rule fruit-bearing; all floral glumes equal or nearly equal in size or lower floral glumes larger than the upper ones (exception: *Kyllinga*, in which lower 1 or 2 glumes are smaller than the upper ones and are empty). 3
- 2a. Spikelets few-flowered; only some of the flowers fruit-bearing; lower 2 to several floral glumes empty and smaller than upper flower-bearing ones. 13
3. Hypogynous bristles or scales present. 4
- 3a. No hypogynous bristles or scales present. 6
4. Styles continuous with the ovary; style-base not thickened. 5
- 4a. Styles jointed with the ovary; style-base spongy-thickened. 3. *Eleocharis*
5. Ovary with 3 hypogynous scales. 1. *Fuirena*
- 5a. Ovary with up to 6 hypogynous bristles. 2. *Schoenoplectus*
6. Styles jointed with the ovary; floral glumes as a rule spirally imbricated. .. 7
- 6a. Styles continuous with the ovary; floral glumes as a rule 2-ranked. 8

7. Style-base falling with the remaining portion of the style, hence the achene not crowned by a verruculose style-base. 4. *Fimbristylis*
- 7a. Style falling apart from its verruculose base, which is persistent at the apex of the achene. 5. *Bulbostylis*
8. Spikelets obvious and easily recognizable, bearing several to many glumes, as a rule 2- to many-flowered; glumes not totally hyaline. 9
- 8a. Spikelets hidden in scalelike bracts which superficially look like glumes and which are imbricately disposed forming a spikeletlike structure; true spikelets consisting of a flower and its subtending hyaline scale, borne at axils of scalelike bracts of spikes. 11. *Hemicarpha*
9. Rhachilla of spikelets not jointed at all; floral glumes falling apart from the rhachillae that are persistent on the axis of spikes. 10
- 9a. Rhachilla of spikelets jointed at base or both at base and between the flowers, hence spikelets falling apart from the axis of spikes. 11
10. Achenes 3-sided; styles 3-fid. 6. *Cyperus*
- 10a. Achenes lenticular, bilaterally flattened; styles 2-fid. 7. *Pycneus*
11. Rhachilla of spikelets jointed only at base, hence spikelets falling entire. 12
- 11a. Rhachilla of spikelets jointed both at base and between flowers, hence spikelets breaking up into internodes when falling. 10. *Torulinum*
12. Achenes 3-sided; styles 3-fid. 8. *Mariscus*
- 12a. Achenes laterally flattened, lenticular; styles 2-fid. 9. *Kyllinga*
13. Fruit-bearing flower(s) borne above staminate flower(s); stigmas 3; style continuous with achene, without clear boundary. 14
- 13a. Fruit-bearing flower(s) borne below staminate flower(s); stigmas 2; style-base jointed at the achene with a clear boundary. 14. *Rhynchospora*
14. Style-base not markedly enlarged; achenes drupelike; hypogynous bristles absent; leaves dorsiventrally flattened; culms terete. 12. *Cladium*
- 14a. Style-base enlarged; achenes not drupelike; hypogynous bristles present; leaves and culms bilaterally flattened in Lesser Antillean specimens. 13. *Machaerina*
15. Pistillate flowers not enveloped in a bottlelike prophyll; achenes bony, on a cuplike hypogynium. 16
- 15a. Pistillate flowers enveloped in a bottlelike prophyll generally termed a utricle; achenes not bony, without hypogynium. 17. *Carex*
16. Achenes not enveloped in two glumes, falling separate from the glumes. 15. *Scleria*
- 16a. Achenes tightly enveloped by two opposite glumes and falling together with them. 16. *Diplachrum*

FUIRENA Rottboell

Fuirena Rottb., Descr. Icon. Rar. Nov. Pl. 70. 1773.

Spikelets ovoid or ellipsoid, terete, usually pubescent, many-flowered; glumes many, tightly imbricate, all similar in shape and bearing a hermaphroditic flower at axil. Flowers subtended by 3 hypogynous squamellae alternate with 1-3 (rarely 6) hypogynous bristles, or bristles absent; ovary developing into triquetrous achene; style-base not thickened or jointed at base; stamens 3.

Perennial or annual herbs, sometimes with creeping rhizome. Culms 3- or 5-gonous, nodose and leafy. Leaves mostly cauline, pubescent or glabrous, 3- or 5-costate. Inflorescence paniculiform with few to many glomerulous clusters of sessile spikelets at few to several nodes; bracts leafy, sheathing at base.

TYPE SPECIES: *Fuirena umbellata* Rottb.

About 20 species in the tropics with the center of differentiation in tropical Africa. A single species occurs in the Lesser Antilles.

1. *Fuirena umbellata* Rottb., Descr. Icon. Rar. Nov. Pl. 70, t. 19, f. 3. 1773; Griseb., Fl. Br. W. Ind. Isl. 573. 1864; C. B. Clarke in Urban, Symb. Antill. 2(1): 97. 1900.

Type locality: Surinam.

Perennial herb, wholly light green. Culms solitary, erect from horizontally creeping rhizome, 50-100 cm. tall, 6-9 mm. thick below, 5-angular, several-nodose, glabrous except below inflorescence. Basal leaves reduced to subaphyllous sheaths; bladed leaves 5-7 to a culm, spaced on middle and upper part of the culm; blades lanceolate to linear-lanceolate, 10-20 cm. long, 5-15 mm. wide, 5-costate, glabrous, briefly acute at apex, suddenly contracted at base, the sheaths 2-5 cm. long, tightly surrounding the culm. Inflorescence paniculiform, with 3-12 glomerulous clusters of spikelets; glomerules single or binate, 15-20 mm. across, bearing 5-10 spikelets, the peduncles white-villose, single or binate, occasionally branched; bracts leaf-like, longer than partial inflorescence. Spikelets ovoid or ovoid-ellipsoid, 4-7 mm. long, brownish-green or dark brownish-green at maturity, acute, wholly covered with woolly hairs. Glumes elliptic, 2 mm. long, ciliate and sparsely pilose outside, the midvein ending in a short recurved awn ca. 1 mm. long. Achenes broadly obovate, 0.8 mm. long, subobtusely triquetrous with obscurely wrinkled sides, the cuneate base with a thickish stipe; style 3-fid. Hypogynous bristles absent. Hypogynous squamellae 3, obovate or oblong, membranous, short-stipitate at base, slightly surpassing the achene.

GENERAL DISTRIBUTION: Pantropic.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe!, Marie Galante!, Dominica, Martinique!, St. Lucia!, St. Vincent, Grenada!.

SCHOENOPLECTUS (Reichenb.) Palla

Schoenoplectus (Reichenb.) Palla in Sitzb. Zool.-Bot. Ges. Wien 38: 49. 1888.

Scirpus sect. *Schoenoplectus* Reichenb., Icon. Fl. Germ. 8: 40. 1846.

Spikelets ovoid to ellipsoid, terete, many-flowered. Glumes as a rule imbricate, rarely 2-ranked, all alike and bearing an axillary bisexual

flower. Flowers hermaphroditic, with a pistil and (1-)3 stamens, subtended by up to 6 hypogynous bristles or bristles absent; achene dorsiventrally lenticular or 3-sided; style elongated, not thickened at base; stigmas 2 or 3.

Annuals or perennials, occasionally with rhizomes. Stems subaphyllous, surrounded at base with bladeless sheaths only. Leaves reduced to bladeless sheaths, rarely with a short blade. Inflorescence subtended by an erect, culmlike bract, hence becoming quasilateral, corymbose with elongated rays or congested in a head.

TYPE SPECIES: *Schoenoplectus lacustris* (L.) Palla, based on *Scirpus lacustris* L.

Over 40 species in tropical, subtropical and temperate regions of the world. A single species is recorded from the Lesser Antilles.

1. *Schoenoplectus americanus* (Pers.) Volkart ex Schinz & Keller, Fl. Schweiz. ed. 2. 1: 75. 1905.

Basionym: *Scirpus americanus* Pers., Synops. Pl. 1: 68. 1805.

Type locality: "Carolina inferiore," U. S. A.

Syn.: *Scirpus olneyi* A. Gray ex Engelm. & A. Gray in Boston Jour. Nat. Hist. 5: 238. 1845; C. B. Clarke in Urban, Symb. Antill. 2(1): 93. 1900. (Type: *Olney*, Rhode Island, U. S. A.)

Schoenoplectus olneyi (A. Gray) Palla in Bot. Jahrb. 10: 299. 1888.

Rhizomes stoloniferous. Culms solitary from nodes of rhizome, erect, 30-200 cm. tall, 3-7 mm. thick below, triquetrous with acute angles and slightly concave sides, smooth, clothed at base with a few sheaths. Basal sheaths 2-4, the lower ones bladeless, light purple-brown or reddish-purple; the uppermost one as much as 30 cm. long, light purple and tinged with light brown, the orifice oblique, occasionally bearing a blade 5-10 cm. long. Inflorescence a pseudolateral head bearing (3-)5-12 spikelets; bract 1, culmlike, as long as to two or three times the length of the head. Spikelets ovoid, ellipsoid or narrowly ovoid, 7-18 mm. long, 3-5 mm. wide, terete, light brown or reddish-purple, blunt or subacute at apex. Floral glumes tightly appressed, imbricate, incurved, broadly ovate, boat-shaped, 2.5-3.2 mm. long, thinly membranous, emarginate or shallowly bilobed at apex, tinged with reddish-purple toward apex and brown-flecked, the midvein 1, yellow-green, ending in an upright mucro which is as long as or shorter than the apical lobes of the glume. Achenes broadly obovate or suborbicular-obovate, biconvex, 1.75-2.25 mm. long, rounded to mucronate apex, cuneate at base, brownish-grey; style 2- (sometimes 3-)cleft. Hypogynous bristles 4, 5, or rarely 6, slightly shorter than to slightly longer than the body of achene, rather sparsely barbed with short retrorse spinules.

GENERAL DISTRIBUTION: Widely distributed in the Americas from southern Canada south to northern Argentina.

DISTRIBUTION IN LESSER ANTILLES: Nevis!.

Proctor's collection (no. 19383, from Clifton Estate, Nevis (A)) makes this species a new addition to the flora of the Lesser Antilles. In the West Indies this species has been previously noted from Hispaniola, Jamaica, and Bermuda. Schuyler (in Rhodora **76**: 51. 1974), upon examination of the type of *Scirpus americanus* Pers. at Paris, identified it with the species commonly called *S. olneyi*, and hence the correct name of *S. olneyi* becomes *S. americanus*, while the species passing as *S. americanus* for a long time now becomes *S. pungens*.

ELEOCHARIS R. Brown

Eleocharis R. Br., Prodr. Fl. Nov. Holl. 224. 1810.

FIGURE 52.

Spikelet solitary, terminal, ovoid, ellipsoid, cylindrical, or occasionally subglobose, densely many-flowered; glumes imbricate, all similar in shape and bearing a bisexual flower at axil. Flowers with 4-6 hypogynous bristles; pistil jointed between ovary and spongy-thickened style-base; achenes lenticular or triangular; stigmas 2 or 3.

Annuals or perennials, often with elongated slender stolons. Culms naked, clothed at base with bladeless sheaths only (i. e., all leaves reduced to basal sheaths). Inflorescence a single spikelet, with a scalelike bract at base.

TYPE SPECIES: *Eleocharis palustris* (L.) Römer & Schultes, based on *Scirpus palustris* L.

About 120 species distributed throughout the world.

KEY TO THE SPECIES

1. Floral glumes 2-ranked; achenes deeply pitted. 10. *E. retroflexa*
- 1a. Floral glumes spirally imbricate; achenes smoothish, trabeculate or punctulate, not deeply pitted. 2
2. Culms usually 4-10 mm. thick, normally 40-120 cm. tall; spikelets cylindrical, as wide as or only slightly wider than the culms; apices of achenes forming an annular thickening which is broader than the base of lanceolate-conical or beaklike style-base. 3
- 2a. Culms usually 0.3-2.0 mm. wide, less than 40 cm. tall (in *E. montana* sometimes up to 80 cm. tall and 2.5 mm. thick); spikelets ovoid or ellipsoid, occasionally oblong, definitely much wider than culm; apices of achenes not forming a conspicuous annular thickening; style-bases conical or depressed-conical, wider than to narrower than the achene body. 5
3. Culms triquetrous, solid, not septate. 1. *E. mutata*
- 3a. Culms terete, hollow, transversely septate. 4
4. Floral glumes 4-5 mm. long, suberect, straw-colored; sheaths obliquely truncate at orifice. 2. *E. interstincta*

- 4a. Floral glumes 2.0-2.5 mm. long, patent, brown; sheaths transversely truncate at orifice. 3. *E. elegans*
- 5. Stigmas 3; achenes trigonous. 4. *E. liogieri*
- 5a. Stigmas 2; achenes biconvex. 6
- 6. Perennials with decumbent or stoloniferous rhizomes. 7
- 6a. Annual with fibrous roots only. 9. *E. geniculata*
- 7. Orifice of sheaths transversely truncate, not inflated or marcescent. 8
- 7a. Orifice of sheaths obliquely truncate, inflated with marcescent hyaline margins. 9
- 8. Culms conspicuously or inconspicuously septate-nodulose; style-base $\frac{1}{2}$ - $\frac{2}{3}$ the width of olive- to red-brown body of achenes. 5. *E. montana*
- 8a. Culms not septate-nodulose; style-base $\frac{1}{3}$ as wide as the yellow to yellow-brown body of achenes. 6. *E. macrostachya*
- 9. Floral glumes 2.0-2.5 mm. long, pale green to light yellowish. 7. *E. flavescentis*
- 9a. Floral glumes 2.5-3.5 mm. long, sanguineous- or purple-brown. 8. *E. maculosa*

1. ***Eleocharis mutata* (L.) Römer & Schultes, Syst. Veg. 2: 155. 1817;**
 C. B. Clarke in Urban, Symb. Antill. 2(1): 61. 1900; Svenson in N.
 Am. Fl. 18(9): 511. 1957.

Basionym: *Scirpus mutatus* L., Amoen. Acad. 5: 391. 1759; Griseb., Fl. Br. W. Ind.
 Isl. 571. 1864.

Type: *Browne*, Jamaica.

Perennial, tufted from short rhizome. Culms coarse, acutely triangular, 40-90 cm. tall, 4-7 mm. thick, smooth. Sheaths 3 or 4 to a culm, membranous, up to 35 cm. long, straw-colored or the lower ones brownish, obliquely truncate and pointed at apex. Spikelet cylindrical, 2-5 cm. long, 4-6 mm. thick, subterete, obtuse at apex, straw-colored. Glumes densely imbricate in many rows, ovate-orbicular to orbicular, shallowly boat-shaped, 2.7-3.0 mm. long, 2.50-2.75 mm. wide, thinly herbaceous to thickly membranous, broadly hyaline on margins, straw-colored and hardly veined on median portion, semitranslucent and finely brown-lineolate on margins. Achenes broadly obovate, compressed-trigonous, 1.5-2.0 mm. long excluding style-base, 1.2-1.5 mm. wide, orange-brown, shiny, cancellated with 22-24 rows of shallow transversely oblong cells; style-base depressed, deltoid, 0.25-0.50 mm. long, with an annular thickening at base; style 3-cleft. Hypogynous bristles 6, equaling or slightly overtopping the achene, brown, retrorsely scabrous with coarse but soft spinules.

GENERAL DISTRIBUTION: Tropical America from southern Mexico and the West Indies south to Brazil; also tropical Africa.

DISTRIBUTION IN LESSER ANTILLES: Anguilla!, Nevis!, Antigua, Guadeloupe, Marie Galante!, La Désirade!, Martinique!, St. Lucia, Grenada.

2. ***Eleocharis interstincta* (Vahl) Römer & Schultes, Syst. Veg. 2: 149, 1817; C. B. Clarke in Urban, Symb. Antill. 2(1): 60. 1900; Svenson in N. Am. Fl. 18(9): 510. 1957.**

Basionym: *Scirpus interstinctus* Vahl, Enum. Pl. 2: 251. 1806.

Type: *Martfelt*, "Caribaeis."

Syn.: *Scirpus plantagineus* Sw., Fl. Ind. Occ. 1: 123. 1797; Griseb., Fl. Br. W. Ind. Isl. 571. 1864, non Retz., 1785.

Rhizome stoloniferous. Culms tufted, 40-100 cm. tall, 3.6 mm. thick below, terete, subrigid, hollow, transversely septate, the intersepta 4-25 mm. long, becoming shorter below the spikelet. Sheaths 3 or 4, membranous to herbaceous, pale green and weakly to strongly stained with red-brown, the orifice obliquely truncate with pointed apex. Spikelet cylindrical (1.5-) 3.0-6.0 cm. long, 5-7 mm. wide, terete, subobtusate, pale green, densely many-flowered; the lowest 2 glumes (bracts) different from floral glumes, semicircular to subdeltoid, subcoriaceous, with white-hyaline margins. Floral glumes oblong to obovate-oblong, 4-5 mm. long, ca. 3 mm. wide, chartaceous, not keeled, straw-colored or greyish-green, obscurely 3-nerved, the apex obtuse to depressed-deltoid, with broad white-hyaline margins. Achenes oval to obovate-oval, 1.5-2.0 mm. long, thickly biconvex, maturing yellow-brownish, slightly shiny, weakly cancellated by 25-30 rows of transversely oblong cells, bearing an annular thickening at apex; style-base lanceolate-conical, flattened, ca. 1 mm. long, dark brown, gradually tapering to the style; style 2 mm. long, 3-cleft above for $\frac{1}{2}$ its length. Hypogynous bristles 6, somewhat longer than the achene body, coarsely retrorsely spinulose.

GENERAL DISTRIBUTION: Subtropical and tropical America, from the southern United States to Brazil.

DISTRIBUTION IN LESSER ANTILLES: Nevis!, Guadeloupe, Marie Galante!, La Désirade!, Dominica!, Martinique!, St. Lucia!, St. Vincent!, Barbados, Grenada!.

3. *Eleocharis elegans* (H.B.K.) Römer & Schultes, Syst. Veg. 2: 150. 1817.

Basionym: *Scirpus elegans* H.B.K., Nov. Gen. Sp. Pl. 1: 226. 1816.

Type locality: Peru.

Syn.: *Scirpus geniculatus* L., Sp. Pl. 1: 42. 1753, pro parte, excl. lectotype.

Eleocharis constricta Schultes in Römer & Schultes, Syst. Veg., Mantissa 2: 87. 1824. (Type locality: Brazil.)

Scirpus constrictus (Schultes) Griseb., Syst. Veg. Karaiben 122. 1857, Fl. Br. W. Ind. Isl. 570. 1864.

Eleocharis geniculata sensu C. B. Clarke in Urban, Symb. Antill. 2(1): 74. 1900, non (L.) Römer & Schultes.

Tufted herbs with thick, lignescent, creeping rhizomes. Culms terete, (10-)30-90-(120) cm. tall, 4-10 mm. thick, rather stiff, glaucous-green, transversely septate, the intersepta 3-10 mm. long. Sheaths 2 or 3, thinly herbaceous, transversely truncate at apex, reddish to reddish-purplish, the uppermost one 6-15 cm. long. Spikelet lanceolate to subcylindrical, terete, 1-2 cm. long, 4-7 mm. thick, obtuse to subacute, brown, very densely bearing numerous flowers; lowest 2-3 glumes (bracts) semicircular to de-

pressed-deltoid, obtuse, 2-3 mm. wide, 1.5-2.5 mm. long, glaucous-green with pale-membranous margin. Floral glumes patent, oblong to oblong-elliptic or lance-oblong, 2.0-2.5 mm. long, rounded to apex, not keeled, the median area thinly chartaceous, brown or yellow-brown, obscurely 3-nerved, the broad hyaline marginal areas pale with red-brown lineolae. Achenes obovate-elliptic to elliptic, biconvex to somewhat trigonous, 0.8-1.0 mm. long, yellow to yellow-brown, weakly shiny, minutely punctulate with rather irregularly disposed, oblong or somewhat isodiametrical cells; style-base lanceolate, 0.3-0.5 mm. long, brown, flattened, annular-thickened at base; style 1.5-2.0 mm. long, 3-cleft above for $\frac{1}{3}$ - $\frac{1}{2}$ its length. Hypogynous bristles 6, brown, equaling to slightly overtopping the style-base, retrorsely scabrous.

GENERAL DISTRIBUTION: From Central America and the West Indies south to Brazil and Peru.

DISTRIBUTION IN LESSER ANTILLES: Dominica, Martinique!

4. *Eleocharis liogieri* T. Koyama in Brittonia 29: 237, f. 1. 1977.

Type: *Alain & Liogier 19006*, Hispaniola, Republica Dominicana (NY!).

Perennial, densely tufted with short, often ascending rhizomes. Culms slender, (6-)10-25(-40) cm. tall, 0.3-0.6 mm. wide, quadrangular, glaucous-green. Sheaths 2 or 3 to a culm, membranous, pale brown and stained with red-brown or wholly reddish-purplish-brown, the orifice obliquely truncate, thinly membranous, dorsally deltoid, subacute; the uppermost sheaths 3-5(-8) cm. long. Spikelet ellipsoid to ovoid-ellipsoid, 4-10 mm. long, 2.0-3.5 mm. wide, obtuse, densely many-flowered; the lowest glume (bract) oblong, 2.0-2.5 mm. long, 1.2-1.5 mm. wide, obtuse or retuse at apex, pale, with broad costa, empty. Floral glumes suberect to erect-patent, elliptical to oblong-elliptical, 1.6-1.8 mm. long, ca. 1 mm. wide, boat-shaped, emarginate at apex, membranous, pale and stained with red-brown on both sides of keel, brown-lineolate above, the margins broadly whitish-hyaline, the costa broadly glaucous-green, 3-nerved, ending below the glume apex. Achenes obovate-orbicular, contracted to apex, 0.6-0.8 mm. long, 0.6-0.8 mm. wide, compressed-trigonous, with rather prominent angles, pale yellowish or light cream-colored, smoothish or very obscurely trabeculate with longitudinally oblong cells; style-base depressed-conical, 0.2-0.3 mm. long, nearly as wide as achene body, pale brownish; style ca. 2 mm. long, 3-cleft above for $\frac{3}{4}$ its length. Stamens 3; anthers 0.5 mm. long. Hypogynous bristles 3 or 4, half as long as to slightly longer than the achene body, whitish, retrorsely spinulose-scabrous or smoothish.

GENERAL DISTRIBUTION: Thus far known from Santo Domingo and the Lesser Antilles.

DISTRIBUTION IN LESSER ANTILLES: Nevis!

This species is recorded from the Lesser Antilles only by a single collection, *Proctor 19429*(A!) from Nevis.

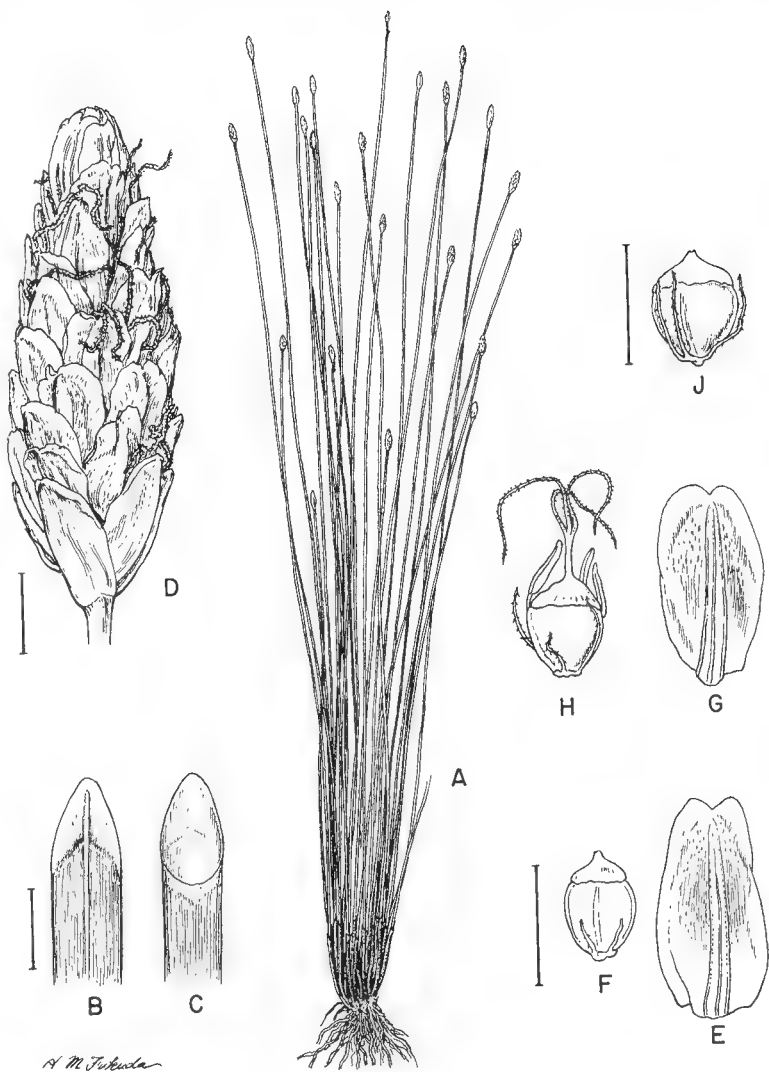


FIGURE 52. Cyperaceae. a-j, *Eleocharis liogieri*: a, habit; b, c, dorsal and ventral views of sheath orifice; d, spikelet; e, g, glumes; f, h-j, achenes. Bar scales (for floral parts) = 1 mm.

5. *Eleocharis montana* (H.B.K.) Römer & Schultes, Syst. Veg. 2: 153. 1817; C. B. Clarke in Urban, Symb. Antill. 2(1): 73. 1900; Svenson in N. Am. Fl. 18(9): 532. 1957.

Basionym: *Scirpus montanus* H.B.K., Nov. Gen. Sp. Pl. 1: 226. 1816.

Type locality: Colombia, Quindiu Pass.

Syn.: *Scirpus nodulosus* Roth, Nov. Pl. Sp. 29. 1821; Griseb., Fl. Br. W. Ind. Isl. 570. 1864. (Type locality: Brazil.)

Eleocharis nodulosa (Roth) Schultes in Römer & Schultes, Syst. Veg., Mantissa 2: 87. 1824; C. B. Clarke in Urban, Symb. Antill. 2(1): 532. 1900.

Perennial with decumbent rhizome, rarely somewhat stoloniferous. Culms densely tufted, 20-80 cm. tall, 1.0-2.5 mm. thick, terete, striate, transversely septate. Sheaths 2 or 3 to a culm, the uppermost one 8-13 cm. long, stramineous and tinged with reddish-brown or reddish-purple toward the base, transversely truncate at orifice, the lower sheaths up to 3 cm. long, deeply reddish- or purplish-brown, slightly obliquely truncate at the orifice. Spikelet lance-oblong, terete, 0.8-1.5 cm. long, 2-4 mm. wide, densely many-flowered, somewhat acute at apex, reddish-brown. Glumes ovate, 2.0-2.5 mm. long, thinly membranous, somewhat acute or obtuse at apex, reddish-brown and whitish on hyaline margin, the keel 1-nerved. Achenes broadly obovate, 1 mm. long, biconvex, olive- or chestnut-brown, finely pitted-reticulate; style-base deltoid, flattened, ca. $\frac{1}{2}$ - $\frac{2}{3}$ the width of achene body, ca. 0.3 mm. long; style 2-cleft; hypogynous bristles 4-6, equaling or slightly longer than the achene body, brownish, minutely retrorsely spinulose.

GENERAL DISTRIBUTION: Tropical and subtropical Americas, from the southern United States through Central America and the West Indies to Uruguay and northern Argentina.

DISTRIBUTION IN LESSER ANTILLES: Nevis!, Antigua, Guadeloupe.

I follow Svenson (1957) in identifying *Scirpus montanus* with *Eleocharis nodulosa*.

6. *Eleocharis macrostachya* Britton in Small, Fl. Southeast. U. S. 184. 1903; Svenson in N. Am. Fl. 18(9): 526. 1957.

Type locality: Oklahoma.

Perennial with slender, long-creeping stolons. Culms forming small tuft or solitary at nodes of stolons, 20-50 cm. tall, 0.8-2.0 (rarely to 3.0) mm. wide, terete, striate when dry, soft to subrigid. Sheaths 2-4, subloosely clothing the culm-base, the lower ones colored with cinnamon- or red-brown, the uppermost 7-10 cm. long, the orifice transversely truncate, often with a mucro, fuscous-colored on margins. Spikelet lanceolate or ovoid-ellipsoid, acute, terete, 8-16 mm. long, ca. 3 mm. wide, light brown; empty glumes (bracts) about 2, the lowest semicircular, often nearly encircling the base of spikelet, dorsally glaucous-green. Floral glumes erect and ap-

pressed, lanceolate, 2.8-3.5 mm. long, thinly membranous, pale with brown flecks, stained with red-brown on upper part on both sides of costa, widely hyaline-margined, the costa 1-nerved, glaucous-green, ending below the glume apex. Achenes obovate, thickly biconvex, 1.3-1.5 mm. long, 0.8-1.0 mm. wide, rounded to apex, deep yellow to brownish, minutely lineolate with longitudinally linear cells; style-base conical, 0.3-0.5 mm. long, ca. $\frac{1}{2}$ the width of achene body; style 2.0-2.5 mm. long, 2-cleft above for $\frac{1}{3}$ - $\frac{2}{5}$ its length. Hypogynous bristles 5, occasionally 4 or 6, varying in length, slightly shorter than the achene body to briefly overtopping the style-base.

GENERAL DISTRIBUTION: Widely distributed from southern Canada south to Argentina and Uruguay.

DISTRIBUTION IN LESSER ANTILLES: Barbados!

This species is known from the Lesser Antilles only through a single collection from St. Joseph, Barbados, *Botanic Station Herbarium no. 545* (collector unknown).

7. *Eleocharis flavescens* (Poir.) Urban, Symb. Antill. 4: 116. 1903; Svenson in N. Am. Fl. 18(9): 523. 1957.

Basionym: *Scirpus flavescens* Poir. in Lam., Encycl. Méth. Bot. 6: 756. 1804.

Type locality: Puerto Rico.

Syn.: *Scirpus flaccidus* Reichenb. ex Spreng. f., Tent. Suppl. Syst. 3. 1828. (Type locality: Surinam.)

Eleocharis ochreatea Nees in Linnaea 9: 294. 1834; Kunth, Enum. Pl. 2: 157. 1837, nomen nudum.

Eleogenus ochreatus Nees in Mart., Fl. Brasil. 2(1): 102. 1842, as "*ocreatus*." (Type: various collections from Brazil cited.)

Eleocharis ochreatus (Nees) Steud., Syn. Pl. Glum. 2: 79. 1855; C. B. Clarke in Urban, Symb. Antill. 2(1): 523. 1900.

Scirpus ochreatus (Nees) Griseb., Fl. Br. W. Ind. Isl. 570. 1864, as "*ocreatus*."

Eleocharis dussiana Böckl. in Allg. Bot. Zeitschr. 2: 54. 1896. (Type: Martinique, Duss 466a).

Eleocharis flaccida (Reichenb. ex Spreng. f.) Urban, Symb. Antill. 2(1): 165. 1900.

Eleocharis ochreatea (Nees) Steud. var. *flaccida* (Reichenb. ex Spreng. f.) Böckl. in Linnaea 36: 437. 1970, comb. illegit.

Rhizome slender, stoloniferous, ca. 1 mm. wide. Culms tufted or solitary or few together at nodes of rhizome, slender and rather soft, (5-)10-40 cm. tall. 0.5-1.0 mm. wide, subterete. Sheaths few, pale or light red-brownish, the uppermost 2-9 cm. long, the orifice hyaline, whitish, obliquely truncate, inflated. Spikelet ovoid to ovoid-ellipsoid, 3-7 mm. long, ca. 2 mm. wide, subacute, pale greenish. Glumes ovate to lance-oblong, 2.0-2.5 mm. long, obtuse, membranous, pale greenish to light yellowish, the obscurely 3-nerved light green costa ending below the glume apex. Achenes broadly obovate, 0.5-0.7 mm. long, thickly biconvex, maturing purple-brown, shiny, punctulate; style-base conical, greenish, 0.1-0.2 mm. long, ca. $\frac{1}{2}$ the width

of achene body; style 1.5-2.0 mm. long, 2-cleft. Hypogynous bristles 6 or 7, shorter than to surpassing the style-base, whitish, retrorsely scabrous. Stamens 3; anthers 1 mm. long.

GENERAL DISTRIBUTION: Eastern and southern United States, Mexico, the West Indies, South America.

DISTRIBUTION IN LESSER ANTILLES: Montserrat!, Guadeloupe, Dominica, Martinique!, St. Lucia.

A variable species, but rather easily recognizable by its pale spikelets.

8. *Eleocharis maculosa* (Vahl) Römer & Schultes, Syst. Veg. 2: 154. 1817; C. B. Clarke in Urban, Symb. Antill. 2(1): 64. 1900; Svenson in N. Am. Fl. 18(9): 524. 1957.

Basionym: *Scirpus maculosus* Vahl, Enum. Pl. 2: 247. 1805; Griseb., Fl. Br. W. Ind. Isl. 570. 1864.

Type: *Richard*, Guadeloupe.

Herb densely tufted with long creeping slender stolons. Culms slender but stiffish, 7-30 cm. tall, 0.50-0.65 mm. thick, obtusely trigonous, sulcate. Sheaths 2 or 3 to a culm, the lower ones red-brown or reddish-purple, the uppermost one up to 4 cm. long, pale greenish above, reddish-brown below, reddish-striate, the orifice obliquely truncate, with white, hyaline, rugose ligules extending beyond the orifice. Spikelet ellipsoid or ovoid-ellipsoid, 5-12 mm. long, 2.0-3.5 mm. across, acute at both ends, deeply red-brown. Glumes tightly imbricate, elliptical or ovate, 2.5-3.5 mm. long, membranous, deeply sanguineous-brown and slightly lustrous on both sides, finely striate, pale-hyaline on margins, the costa 1-nerved, ending below the obtuse or rounded hyaline apex. Achenes obovate, 1 mm. long excluding the style-base, biconvex, contracted at apex, attenuated at base, the surface roughened, shining black at maturity; style-base depressed-conical, $\frac{2}{3}$ the width of achene body; style 2-cleft. Hypogynous bristles 7 or 8, unequal in length, shorter than to nearly as long as the achene, rust-brown, minutely retrorsely scaberulous with numerous spinules.

GENERAL DISTRIBUTION: Central America, the West Indies, and northern South America (Venezuela, Brazil, Colombia, Ecuador, Bolivia).

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe!, Dominica, Martinique!.

This species is easily discernible by the white, hyaline, rugose ligule extending beyond the orifice of the uppermost sheaths.

9. *Eleocharis geniculata* (L.) Römer & Schultes, Syst. Veg. 2: 150. 1817.

Basionym: *Scirpus geniculatus* L., Sp. Pl. 1: 48. 1753, pro parte, with regard to type.

Type locality: Jamaica.

Syn.: *Scirpus caribaeus* Rottb., Descr. Pl. Rar. Progr. 24. 1772. (Type locality: Jamaica.)

Eleocharis capitata R. Br., Prodr. Fl. Nov. Holl. 225. 1810; C. B. Clarke in Urban, Symb. Antill. 2(1): 66. 1900. (Type locality: Australia.)
Eleocharis caribaea (Rottb.) S. F. Blake in Rhodora 20: 24. 1918; Svenson in N. Am. Fl. 18(9): 520. 1957.

Tufted annual with fibrous roots only. Culms densely tufted in clumps, 7-30 cm. tall, 0.2-0.4 mm. thick, filiform but not soft, pale or slightly glaucous-green, obscurely few-costate. Basal sheaths 0.5-3.0 cm. long, pale green, often tinged with red-brown on lower part, transversely truncate at orifice; orifice not hyaline. Spikelets ovoid-globose to ovoid-ellipsoid, 3-7 mm. long, 3-4 mm. wide, rounded at base, very obtuse at apex, reddish-ferrugineous or lightly ferrugineous, densely many-flowered. Glumes patent, broadly elliptic to ovate-oval, 2 mm. long, obtuse at apex, membranous, pale brownish, the green midvein ending below the glume apex. Achenes broadly obovate, 1 mm. long, thickly biconvex, maturing black, shiny, not cancellated, suddenly contracted to apex; style 1.5-1.7 mm. long, 2-cleft at apex, the base depressed-conical, $\frac{1}{3}$ the width of the achene. Hypogynous bristles 6 or 7, ferrugineous, slightly longer than the achene body, retrorsely spinulose.

GENERAL DISTRIBUTION: Pantropic.

DISTRIBUTION IN LESSER ANTILLES: Anguilla!, St. Barts!, Nevis!, Antigua, Guadeloupe!, Marie Galante!, Martinique!, St. Lucia!, St. Vincent!, Barbados.

10. *Eleocharis retroflexa* (Poir.) Urban, Symb. Antill. 2(1): 165. 1900.

Basionym: *Scirpus retroflexus* Poir. in Lam., Encycl. Méth. Bot. 6: 753. 1804.

Type locality: Puerto Rico.

Syn.: *Cyperus depauperatus* Vahl, Enum. Pl. 2: 305. 1806. (Type: von Rohr, West Indies.)

Eleocharis depauperata (Vahl) Kunth, Enum. Pl. 2: 140. 1837.

Eleocharis chaetaria sensu C. B. Clarke in Urban, Symb. Antill. 2(1): 68. 1900, non Römer & Schultes.

Annual, tufted in small clumps. Culms filiform, mostly curved, 4-10 cm. tall, 0.2-0.3 mm. wide, angular, light green. Sheaths 1 or 2, 0.5-3.0 cm. long, thinly membranous, pale, often stained with red-brown, obliquely truncate at lanceolate orifice. Spikelet ovate or elliptic, 2.5-4.0 mm. long, 1.0-1.7 mm. wide, weakly laterally flattened, bearing 2-6 distichously disposed flowers, sanguineous-tinged. Glumes subloosely 2-ranked, lance-ovate to ovate, boat-shaped, 1.5-2.5 mm. long, subacute to subobtuse at apex, membranous, pale and sanguineous- or purple-brown-stained on both sides, rather widely pale-hyaline on margins, the keel acute, pale green, 3-nerved, ending below or reaching the glume apex. Achenes obovate, 0.60-0.75 mm. long, 0.4-0.5 mm. wide, trigonous with prominent angles and convex sides, each side pitted with 7-10 rows of isodiametrical foveolae, maturing olive-yellow, often with scattered tannin cells; style-base conical, ca. 0.35 mm. high and wide; style ca. 1 mm. long, 3-cleft above for $\frac{2}{3}$ - $\frac{3}{4}$ its

length. Hypogynous bristles 6, shorter than to somewhat longer than the achene body, retrorsely scabrid toward apex.

GENERAL DISTRIBUTION: From the southern United States through Central America and the West Indies to Brazil.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe, Martinique!, Dominica, St. Lucia!, Grenada!.

This species is represented in the Old World tropics by subsp. *chaetaria* (Römer & Schultes) T. Koyama, which differs from the typical phase in the broader glumes and achenes.

FIMBRISTYLIS Vahl

Fimbristylis Vahl, Enum. Pl. 2: 285. 1806.

FIGURE 53.

Spikelets bisexual, ovoid to globose or ellipsoid; glumes many, imbricate or nearly 2-ranked on a continuous simple axis, each glume bearing an axillary hermaphroditic flower. Flowers consisting of a pistil and 2 or 3 stamens; hypogynous bristles absent. Achenes trigonous or dorsiventrally lenticular; styles dropping off from the achene after anthesis, filiform or flattened, the latter kind usually fimbriate-margined; stigmas 2 or 3.

Small or medium-sized annual or perennial sedges. Culms not noded, leaved only at base. Leaves narrowly linear, flattish, obscurely costate, sometimes folded and obscurely 2-ranked; sheaths without a ligule or with a fringe of pubescence at orifice. Inflorescence an umbelliform corymb or a congested head, subtended by involucre bracts, simple or compound, with few to numerous spikelets.

TYPE SPECIES: *Fimbristylis dichotoma* (L.) Vahl, based on *Scirpus dichotomus* L.

About 150 species, dominant in tropical and temperate Eurasia, some being in tropical Africa, and relatively few in tropical and temperate North and South America.

KEY TO THE SPECIES

1. Glumes (at least the lower ones) 2-ranked. 1. *F. ovata*
- 1a. Glumes spirally imbricate. 2
2. Stigmas 3; achenes 3-sided. 3
- 2a. Stigmas 2; achenes biconvex. 6
3. Achenes milky-white to cream-yellow, trabeculate with transversely oblong epidermal cells. 4
- 3a. Achenes brown or dark brown, smoothish to punctulate with minute longitudinally oblong cells. 5. *F. cymosa*
4. Plants with obvious rhizomes (which are usually short); upper leaves at culm-bases bladed. 2. *F. complanata*
- 4a. Plants annual or biennial without rhizome; few upper leaves at culm-bases reduced to bladeless sheaths. 5

5. Leaf blades dorsiventrally flattened; culms not flattened; spikelets ovoid. 4. *F. quinquangularis*
- 5a. Leaf blades and culms laterally flattened; spikelets globose. . . 3. *F. miliacea*
6. Styles filiform, not flattened, not fimbriate. 7
- 6a. Styles dorsiventrally flattened, fimbriate at least on upper margins. 8
7. Achenes brown to dark brown; leaves linear, 1-4 mm. wide; spikelets rusty-brown; glumes obtuse-tipped. 5. *F. cymosa* subsp. *spathacea*
- 7a. Achenes yellowish; leaves filiform, 0.2-0.3 mm. wide; spikelets pale greenish; glumes short-awned at acute tip. 6. *F. vahlii*
8. Glumes pubescent; lower leaves on culm-bases above the basal scaly cataphylls reduced to bladeless sheaths. 7. *F. ferruginea*
- 8a. Glumes glabrous; all leaves bladed except for basal scaly cataphylls. 9
9. Spikelets 3.0-3.5 mm. wide; leaves rigid, without conspicuous ligule. 8. *F. spadicea*
- 9a. Spikelets 2.5-3.0 mm. wide; leaves soft, with a ligule of a fringe of pubescence. 9. *F. dichotoma*

1. *Fimbristylis ovata* (Burm. f.) Kern in Blumea 15: 126. 1967.

Basionym: *Carex ovata* Burm. f., Fl. Ind. 194. 1768.

Type locality: Java.

Syn.: *Cyperus monostachyos* L., Mant. Pl. 2: 180. 1771.

Abildgaardia monostachya (L.) Vahl, Enum. Pl. 2: 296. 1806; Griseb., Fl. Br. W. Ind. Isl. 569. 1864.

Fimbristylis monostachya (L.) Hassk., Pl. Jav. Rar. 61. 1841; C. B. Clarke in Urban, Symb. Antill. 2(1): 83. 1900.

Abildgaardia ovata (Burm. f.) Kral in Sida 4: 72. 1971.

Subloosely tufted perennial with short rhizome. Culms slender, 10-40 cm. tall, 0.5-0.8 mm. thick, angular. Leaf blades slenderly linear, $\frac{1}{2}$ - $\frac{3}{4}$ the length of the culm, flattish with more or less incurved margins, 0.5-1.2 mm. wide, glabrous, blunt at apex; sheaths 1-3 cm. long, yellowish-brown, eventually disintegrating into fibers. Inflorescence a single, terminal spikelet; bracts 2 or 3, scalelike, or the lowest bract with setaceous extension of the midvein ca. 1 cm. long. Spikelet ovate, subacute at apex, weakly laterally flattened with obtuse angles, 8-15 mm. long, 4-7 mm. wide, glaucous-yellow or yellow-green. Glumes ovate or broadly ovate, boat-shaped with an acute keel, 3-6 mm. long, acute at apex, chartaceous, yellowish, weakly shiny, with a 3-nerved green costa ending in a mucro at the glume apex; lower glumes 2-ranked, the upper ones becoming imbricate. Achenes broadly obovate, 2-3 mm. long, trigonous, contracted at apex, short-stipitate at base, white, somewhat bony, verruculose; style 2 mm. long, ciliate above, thickened at base; stigmas 3, as long as the style.

GENERAL DISTRIBUTION: Pantropic.

DISTRIBUTION IN LESSER ANTILLES: Anguilla!, Barbuda, Antigua, Guadeloupe!, Dominica!, Martinique!, St. Lucia!, St. Vincent, Grenada!.

This species of *Fimbristylis* is easily discernible by its flattened, ovate spikelet and by the large achenes up to 3 mm. long. Though usually not

locally common, it is widespread throughout the tropics, and extends in eastern Asia as far north as temperate Japan. In spite of the wide range, this species is morphologically quite invariable.

2. **Fimbristylis complanata** (Retz.) Link, Hort. Berol. Descr. 1: 292. 1827; C. B. Clarke in Urban, Symb. Antill. 2(1): 81. 1900; Kral in Sida 4: 106, f. 27. 1971.

Basionym: *Scirpus complanatus* Retz., Obs. Bot. 5: 14. 1791.

Type locality: India.

Syn.: *Fimbristylis autumnalis* Römer & Schultes var. *complanata* (Retz.) Küken-thal in Bot. Jahrb. 59: 50. 1924.

Polymorphic perennial. Rhizome horizontal or at times short, clothed with brown fibers. Culms closely arranged in a row along rhizome or more or less tufted, markedly flattened-trigonus, 30-70 cm. tall, 2-5 mm. wide, stiffish, glabrous, smooth, narrowly winged above at least below corymb, clothed at base with few sheaths. Leaves few to a culm; blades shorter than the culm, flat, 3-5 mm. wide, stiffly herbaceous, blunt at apex, scabrid on upper margins; sheaths laterally compressed with sharply keeled back, the ventral membranous side rusty-colored, obliquely truncate at orifice; ligule a fringe of short pubescence. Corymbs compound or decompound, 4-10 cm. long, 3-6 cm. wide, subloose to subdense; rays 2-5, 1-7 cm. long, flattened, scabrid; leafy bracts 2-4, the lowest one suberect, shorter than the corymb. Spikelets small, oblong to lance-ovate, 4-9 mm. long, 1-2 mm. wide, suddenly acute at apex, rusty-brown, subloosely 5- to 15-flowered. Glumes ovate, 2.5-3.0 mm. long, abruptly contracted to mucronate apex, chartaceous, rusty-brown, 1-keeled, the keel green, projecting into a short cusp. Achenes broadly obovate, trigonus, 1.5 mm. long, milky-white, finely cancellated with several rows of transversely oblong epidermal cells; style slender, ca. 1 mm. long, not ciliate; stigmas 3, as long as the style. Anthers ca. 1 mm. long.

GENERAL DISTRIBUTION: Pantropic.

DISTRIBUTION IN LESSER ANTILLES: Montserrat!, Guadeloupe, Dominica, Martinique!, St. Lucia!, St. Vincent, Grenada.

3. **Fimbristylis miliacea** (L.) Vahl, Enum. Pl. 2: 287. 1806; C. B. Clarke in Urban, Symb. Antill. 2(1): 81. 1900; Kral in Sida 4: 108, f. 29. 1971.

Basionym: *Scirpus miliaceus* L., Syst. Nat. ed. 10. 868. 1759.

Type locality: India.

Syn.: *Fimbristylis littoralis* Gaud. in Freyc., Voy. Bot. 431. 1826; S. T. Blake in Jour. Arnold Arb. 35: 217. 1954.

Annual or occasionally apparently biennial, densely tufted, without rhizome. Culms 10-50 cm. tall, 1-5 mm. wide below, flattened to 4-sided with 2 sharp edges, smooth, glabrous, leaved at base. Few upper leaves bladed, the lower leaves cataphylloid; blades laterally compressed, shorter than to surpassing the culm, gradually narrowed to long, acuminate apex, 1-4 mm.

wide at base, light green, soft; sheaths laterally flattened, greenish or the lower ones pale or tinged with rusty or dusky brown, obliquely truncate at orifice with membranous margins. Corymbs ample, decompound, open, subdense to subloose with numerous spikelets, 3-8 cm. long and as wide; bracts 2-4, setaceous, $\frac{1}{2}$ - $\frac{3}{4}$ the length of rays, the dilated base with brown, membranous margins; rays 3-7, unequal, patent, 1-5 cm. long, scabrid. Spikelets solitary, ovoid-globular to globular, 1.5-5.0 mm. long, 1.5-3.0 mm. wide, rounded at both ends, rusty-brown, densely many-flowered. Glumes patent, broadly ovate, 1.0-1.2 mm. long, obtuse at apex, membranous, reddish-brown with broadly white-hyaline margins, the 3-nerved keel ending below the apex. Achenes broadly obovate, trigonous, 0.75-1.00 mm. long, cream-yellow, cancellated with rows of fine, transversely oblong cells, usually sparsely verruculose; style slender, not fimbriate, 0.7 mm. long; stigmas 3, as long as the style. Anthers ca. 0.6 mm. long.

GENERAL DISTRIBUTION: Pantropic. A native of the Old World, its occurrence in the New World is apparently of adventive origin, most likely concurrent with the introduction of rice.

DISTRIBUTION IN LESSER ANTILLES: St. Lucia!, Grenada!.

The occurrence of this weed in the Lesser Antilles has not been mentioned in any previous publication. The entry of this species here is based upon two collections by Proctor (18017, from St. Lucia (A!), and 16838, from St. George, Grenada (A!)), suggesting its recent introduction.

Since the Linnaean specimens of *Scirpus miliaceus* are a mixture of *Fimbristylis miliacea* and *F. quinquangularis* (in the conventional sense), differing opinions have been held as to the selection of the Linnaean type of this species (see S. T. Blake in Jour. Arnold Arb. 35: 217-219. 1954, and Kern in Taxon 3: 246. 1954). For reasons previously explained in detail (e.g., Kral in Sida 4: 109. 1971, and Koyama in Bot. Mag. [Tokyo] 87: 316. 1974), I prefer to follow the concept of Kern in retaining the original usage of the well-established name *F. miliacea* for this species.

4. *Fimbristylis quinquangularis* (Vahl) Kunth, Enum. Pl. 2: 229. 1837; Kral in Sida 4: 110, f. 30. 1971.

Basionym: *Scirpus quinquangularis* Vahl, Enum. Pl. 2: 279. 1806.

Type locality: "India orientalis" (presumably from Ceylon).

Densely tufted annual or apparently short-lived perennial with very short rhizome. Culms erect, 15-70 cm. tall, 1.2-2.5 mm. thick, acutely pentagonous, scabrid below the corymb, clothed at base with 2-4 bladeless sheaths. Lower leaves at culm-bases bladeless, upper ones as well as those forming sterile shoots, bladed; blades shorter than to equaling the culm, flattish-plicate, 2-3 mm. wide, rather abruptly narrowed at subacute or obtuse apex; sheaths cylindrical, 3-15 cm. long, straw-colored, ventrally membranous and rusty-brown, obliquely truncate at orifice. Corymbs compound to decompound, 4-9 cm. long, 3-7 cm. wide; rays 3-5, patent, 1-5 cm. long, scabrous; secondary corymbs subdense; bracts 3-5, setaceous,

much shorter than the rays. Spikelets solitary, ovoid, 2-5 mm. long, 1.2-1.7 mm. wide, subobtuse to suddenly subacute at apex, rusty-brown or slightly yellowish-brown. Glumes ovate, 1.7-2.0 mm. long, rounded or contracted to sometimes mucronate apex, membranous, yellowish- or rusty-brown, with wide, pale brownish, hyaline margins, tinged with dark brown on both sides of 3-nerved keel. Achenes broadly obovate, trigonous, 0.8-1.0 mm. long, cream-yellow, finely cancellated with rows of transversely oblong cells, usually verruculose; style 1.0-1.5 mm. long, glabrous, somewhat dilated at base; stigmas 3, longer than the style. Anthers 0.5 mm. long.

GENERAL DISTRIBUTION: Widely distributed in the Old World tropics from Africa through India eastward to northern Australia; introduced in Puerto Rico and the Lesser Antilles.

DISTRIBUTION IN LESSER ANTILLES: St. Lucia!

The new introduction of this weed in rice fields on St. Lucia is documented by Proctor (no. 18077 from Anse-la-Raye, St. Lucia (A!)).

5. *Fimbristylis cymosa* R. Br., Prodr. Fl. Nov. Holl. 228. 1810, subsp. *spathacea* (Roth) T. Koyama in Micronesica 1: 83. 1964.

Basionym: *Fimbristylis spathacea* Roth, Nov. Sp. Pl. 24. 1821; Kral in Sida 4: 126, f. 43a. 1971.

Type locality: India.

Syn.: *Fimbristylis obtusifolia* sensu C. B. Clarke in Urban, Symb. Antill. 2(1): 82. 1900, non Kunth.

Scirpus obtusifolius sensu Griseb., Fl. Br. W. Ind. Isl. 571. 1864, non Lam.

Densely tufted perennial with short rhizome. Culms stiffly erect, 5-60 cm. tall, 1-2 mm. thick, obtusely trigonous, smooth, glabrous, the base clothed with leaf sheaths and their dusky brown fibrous remnants. Leaves radical, many; blades narrowly linear, patent to recurved, much shorter than the culm, 1-4 mm. wide, subcoriaceous, flattish to weakly recurved-margined, abruptly contracted at subobtuse apex, scabrous on upper margins; sheaths not flattened, ventrally membranous, whitish or cinnamon-colored; ligule absent. Inflorescence varying from a compound open corymb of up to 3 cm. long and 5 cm. wide to head of 7-15 mm. in diameter; rays, when present, 2-6, 1-3 cm. long; leafy bracts 1-3, mostly shorter than the corymb. Spikelets solitary to clustered, oblong-elliptic to ovate-oblong, 3-6 mm. long, 1.5-2.5 mm. wide, obtuse at apex, densely many-flowered, rusty- or somewhat greyish-brown. Glumes tightly imbricate, ovate to broadly ovate, 1.0-1.3 mm. long, obtuse, membranous, rusty-brown and broadly white-hyaline on margins, 3- or 5-nerved. Achenes broadly obovate, 0.75-1.00 mm. long, obcompressed-trigonous to nearly biconvex, maturing dark brown, almost smooth; style ca. 1 mm. long, only weakly flattened, not fimbriate; stigmas 2 or occasionally 3, as long as the style. Anthers ca. 1 mm. long.

GENERAL DISTRIBUTION: Pantropic.

DISTRIBUTION IN LESSER ANTILLES: Anguilla!, St. Martin!, St. Barts!, Antigua!, Guadeloupe!, Martinique, St. Lucia!, the Grenadines!, Grenada!.

There have been opposing opinions as to whether *F. spathacea* is specifically distinct from *F. cymosa* of Australia, the Pacific Islands and Malesia. Having examined a number of specimens collected throughout the world, I am convinced that the only difference between the two is in the pistils: in the former, the thickly biconvex achenes have a distigmatic style, while in the latter, the obtusely trigonous achenes have a tristigmatic style. In the Cyperaceae, such a difference in pistils may sometimes warrant a specific separation, provided it is associated with other characters and/or no intermediate conditions exist between the distigmatic and tristigmatic taxa. In some localities, populations of *F. spathacea* contain plants with trigynous or imperfectly trigynous pistils as well as plants with digynous pistils, not permitting its clear separation from *F. cymosa*. For this reason, *F. spathacea*, in my opinion, is no more than a subspecies of *F. cymosa*.

Although the name *F. obtusifolia* (Lam.) Kunth is applied to this species, the Lamarckian type of *Scirpus obtusifolius* has nothing to do with this species, but represents a monstrosity of *F. dichotoma* according to Dr. J. Raynal, who so kindly examined the type for me (pers. comm.). *Fimbristylis cymosa* R. Br. is, therefore, still the correct name for this species complex.

6. *Fimbristylis vahlii* (Lam.) Link, Hort. Berol. Descr. 1: 287. 1827; C. B. Clarke in Urban, Symb. Antill. 2(1): 80. 1900; Kral in Sida 4: 124, f. 41. 1971.

Basionym: *Scirpus vahlii* Lam., Illustr. 1: 139. 1791.

Type locality: Tropical America.

Filiform annual, densely tufted with fibrous roots only. Culms slender but rather stiff, 1-10 cm. tall, 0.2-0.3 mm. wide, 3-sided, smoothish or spinulose especially below the inflorescence. Leaves 2 or 3 to a culm, shorter than to overtopping the culm, filiform, 0.20-0.25 mm. wide, soft, weakly involute, spinulose-hirsute or occasionally glabrescent; sheaths pale to straw-colored; ligule absent. Inflorescence a headlike cluster bearing 3-8 spikelets; bracts 3-5, filiform, up to 8 cm. long. Spikelets sessile, lanceolate to lance-oblong, 5-10 mm. long, 1.5-2.5 mm. wide, subacute at apex, terete, pale greenish, densely many-flowered. Glumes lanceolate to lance-ovate, 1.3-1.5 mm. long, ca. 0.5 mm. wide, gradually attenuate from above the base to the acute apex, membranous, pale and straw-brown-variegated on both sides of costa, the green costa excurrent beyond the glume apex in a weakly recurved awn up to 0.3 mm. long. Achenes obovate, thickly biconvex, 0.3-0.5 mm. long, rounded to apex, maturing yellowish, trabeculate with 4-6 rows of transversely oblong epidermal cells. Style 0.8-1.0 mm.

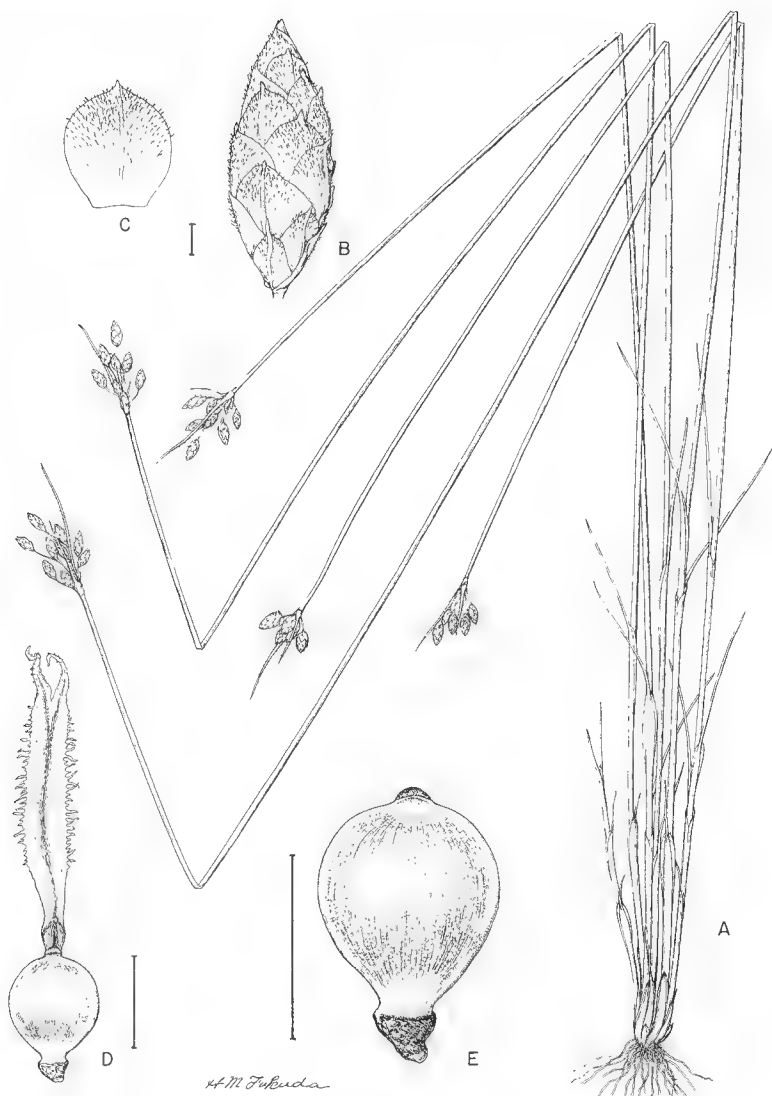


FIGURE 53. Cyperaceae. a-e, *Fimbristylis ferruginea*: a, habit; b, spikelet; c, glume; d, achene with pistil; e, achene. Bar scales (for floral parts) = 1 mm.

long, filiform, not flattened, dilated at base, 2-cleft above for $\frac{1}{3}$ its length. Stamen 1.

GENERAL DISTRIBUTION: From the temperate United States south to Brazilian Pará and northern Peru.

DISTRIBUTION IN LESSER ANTILLES: Antigua (n. v.).

Liebmann's collection from Antigua (cited by C. B. Clarke, who had not seen it either) is the only record of this rare species from the Lesser Antilles.

7. *Fimbristylis ferruginea* (L.) Vahl, Enum. Pl. 2: 291. 1806; C. B. Clarke in Urban, Symb. Antill. 2(1): 78. 1900; Kral in Sida 4: 114, f. 34. 1971.

Basionym: *Scirpus ferrugineus* L., Sp. Pl. 1: 50. 1753; Griseb., Fl. Br. W. Ind. Isl. 572. 1864.

Type locality: Jamaica.

Perennial, densely tufted, often forming large clumps; rhizome short, clothed with greyish-brown scales. Culms 15–75 cm. tall, 0.5–1.5 mm. thick below, obtusely trigonous, rather soft, smooth, glabrous, clothed at base with 2–4 sheaths. Upper leaves bladed, the blades 1–15 cm. long, up to 2.5 mm. wide, canaliculate to involute-margined, glaucous-green, obtuse; ligule a fringe of short whitish pubescence; sheaths 2–12 cm. long, the hyaline ventral side brown to orange-brown, the basal 1 or 2 sheaths cataphylloid, brown to dusky brown. Corymbs simple or occasionally in part compound, open but subdense, 1.2–5.0 cm. long, bearing 3–15 spikelets; bracts 1–3, the longest $\frac{1}{2}$ – $\frac{2}{3}$ the length of the longest ray; rays 3–7, unequal, 0.7–4.0 cm. long, each bearing 1–3 spikelets. Spikelets lance-ovate or lance-elliptic, terete, 8–15 mm. long, 2.5–4.0 mm. wide, densely many-flowered, brownish. Glumes spirally imbricate, broadly ovate-elliptic or broadly ovate, 3.5–4.2 mm. long, boat-shaped with subacute keel, subabruptly contracted to mucronate apex, thinly chartaceous, light greyish-brown below, deep brown or rusty-brown above on both sides of the keel, pubescent with short appressed hairs principally on upper half, ciliolate on margins; the keel 1-nerved. Achenes broadly obovate, unequally biconvex, 1.0–1.2 mm. long, rounded to mucronate apex, light orange- or yellow-brown, the surfaces finely cancellated with 30–35 rows of isodiametric epidermal cells; gynophore 0.25 mm. long; style 3 mm. long, flattened, densely fimbriate, hardly dilated at base; stigmas 2, 0.5 mm. long.

GENERAL DISTRIBUTION: Pantropic.

DISTRIBUTION IN LESSER ANTILLES: St. Thomas, Nevis!, Antigua, Guadeloupe!, Marie Galante!, La Désirade!, Martinique!, St. Lucia!, St. Vincent, Mustique, Barbados.

8. *Fimbristylis spadicea* (L.) Vahl, Enum. Pl. 2: 294. 1806; C. B. Clarke in Urban, Symb. Antill. 2(1): 79. 1900; Kral in Sida 4: 131, f. 47. 1971.

Basionym: *Scirpus spadiceus* L., Sp. Pl. 1: 51. 1753; Griseb., Fl. Br. W. Ind. Isl. 572. 1864.

Type locality: Jamaica.

Densely tufted herb with short rhizome. Culms 20-120 (-200) cm. tall, 1.5-3.5 mm. thick below, trigonous, smooth, rigid. Leaves numerous, narrowly linear, 10-80 cm. long, 1-3 mm. wide but strongly involute, stiffish, rather thick, smooth or scabrid; sheaths broader than the blade, stained with chocolate- or reddish-brown, slightly lustrous, the ligule normally absent. Corymb open, compound or decompound, 10-20 cm. long, 6-10 cm. wide; leafy bracts 3-5, the longest overtopping or occasionally equaling the corymb, up to 25 cm. long; rays 6-14, unequal, the shorter ones bearing 1-5 spikelets, the longer ones up to 15 cm. long, the secondary corymbs simple or compound, 2-6 cm. long, bearing up to 11 raylets 1-4 cm. long, the bracteoles setaceous, the longest nearly equaling the central sessile spikelet of the secondary corymb. Spikelets solitary, lance-ovate to lance-oblong, acute, terete, 10-15 mm. long, 3.0-3.5 mm. wide, deep brown, densely many-flowered. Glumes spirally imbricate, oval to broadly ovate, 2.8-3.2 mm. long, rounded to mucronate at apex, boat-shaped, thinly chartaceous, slightly shiny, brown and further stained with deep chocolate brown on upper part on both sides of the costa, the hyaline margins pale brown, the costa pale brown, finely 3- to 5-nerved, ending in a greenish mucro at the very apex of the glume. Achenes obovate, biconvex, 1.0-1.2 mm. long, contracted to mucronulate apex, maturing brown, cancellated with 14-22 rows of isodiametric or nearly square foveolae; style 2.5-3.0 mm. long, flattened, fimbriate on upper half; stigmas 2, 0.8 mm. long.

GENERAL DISTRIBUTION: Coasts of Central and South America, from Mexico and the West Indies south to northern Argentina and Colombia.

DISTRIBUTION IN LESSER ANTILLES: Barbuda, Martinique!, Grenada!

9. *Fimbristylis dichotoma* (L.) Vahl, Enum. Pl. 2: 287. 1806; Kral in Sida 4: 117, f. 37a. 1971.

Basionym: *Scirpus dichotomus* L., Sp. Pl. 1: 50. 1753.

Type locality: India.

Syn.: *Scirpus annuus* All., Fl. Pedemont. 2: 277. 1785. (Type locality: "India orientalis.")

Fimbristylis diphylla (Retz.) Vahl, Enum. Pl. 2: 289. 1806; C. B. Clarke in Urban, Symb. Antill. 2(1): 77. 1900.

Fimbristylis annua (All.) Römer & Schultes, Syst. Veg. 2: 95. 1817; Kral in Sida 4: 121, f. 39a,b. 1971.

Scirpus brizoides Muhl., Descr. uber. Gram. 36. 1817, in cit.; Griseb., Fl. Br. W. Ind. Isl. 572. 1864.

Fimbristylis brizoides (Muhl.) Nees in Linnaea 9: 290. 1834; Griseb., Fl. Br. W. Ind. Isl. 572. 1864.

Annual or in warmer regions becoming biennial or short-lived perennial. Culms solitary or subloosely tufted, occasionally with short rhizome, erect, 10-70 cm. tall, 0.5-1.5 mm. thick, trigonous, soft to stiffish, smooth, glau-

cous-green, pilose to glabrous; sheaths tightly surrounding the culm, cylindrical, pilose to glabrous, the membranous ventral side cinnamon-brown or light brown; ligule a fringe of pubescence. Corymbs simple, compound or decompound, 2-8 cm. long, 1-5 cm. wide, loose to subdense; rays 2-5, 1-6 cm. long, slender, smooth, glabrous to sparingly pilose; bracts 2-5, the lower one leafy and shorter than to overtopping the corymb, the remainder setaceous. Spikelets solitary or in clusters of 2 or 3, ovate to ovate-elliptic, 4-8 mm. long, 2.5-3.0 mm. wide, subacute, terete, brownish to chestnut-brown, slightly shiny, densely many-flowered. Glumes broadly ovate, suberect, 2-3 mm. long, contracted to often mucronate apex, chartaceous, faintly few-nerved on both sides, yellowish and tinged with reddish-brown or dark brown especially on the upper half, the costa 3-nerved, greenish, forming a mucro at glume apex. Achenes broadly obovate, 0.8-1.2 mm. long, biconvex, rounded to apex, short-stipitate at base, whitish to yellowish at maturity, cancellated with 5-8 rows of transversely rectangular cells; style strongly compressed, copiously fimbriate above the middle, dilated at base; stigmas 2.

GENERAL DISTRIBUTION: Cosmopolitan, except in arctic and subarctic regions.

DISTRIBUTION IN LESSER ANTILLES: Antigua, Guadeloupe, Dominica!, Martinique!, St. Lucia!, St. Vincent!, Bequia, Grenada!.

BULBOSTYLIS Kunth

Bulbostylis Kunth, Enum. Pl. 2: 205. 1837, nom. cons. FIGURE 54.

Spikelets large or small, ovoid or ellipsoid, bisexual; glumes all alike and bearing a bisexual flower, ovate, herbaceous to membranous, spirally imbricate along continuous axis, keeled. Flowers hermaphroditic; hypogynous bristles absent; stamens 1-3, mostly 2; achenes obovate, trigonous; style filiform, the base thickened and bulbous, persistent at apex of achene, hence the style falling apart from the base; stigmas 3.

Annuals or perennials (in African and South American species often with woody caudices). Culms slender to capillary, leaves only at base. Leaves with filiform or linear blades, often inrolled, rarely reduced to bladeless sheaths. Inflorescence corymbose, capitate, or reduced to a single terminal spikelet.

TYPE SPECIES: *Bulbostylis capillaris* (L.) Kunth ex C. B. Clarke, based on *Scirpus capillaris* L.

About 90 species in tropical to temperate regions of the world with a high concentration of species in tropical Africa.

KEY TO THE SPECIES

1. Floral glumes spirally imbricate; inflorescences truly terminal, subtended by patent bracts. 2

- 1a. Floral glumes 2-ranked, though some of them being irregularly so; inflorescences becoming quasilateral with the lowest bract erect and continued down to the culm apex. 3. *B. pauciflora*
2. Inflorescences with at least 1 short ray, usually more or less open with clusters of spikelets on short rays; glumes 2 mm. long, wholly roughened with short hairs. 1. *B. capillaris* subsp. *antillana*
- 2a. Inflorescences a head; glumes 1.5–2.0 mm. long, glabrescent or sparsely hispidulous on distal part. 2. *B. barbata*

1. ***Bulbostylis capillaris* (L.) Kunth ex C. B. Clarke in Hook. f., Fl. Brit. Ind. 6: 652. 1893, subsp. *antillana* (Britton) T. Koyama in Howard, in Jour. Arnold Arb. 60: 322. 1979.**

Basionym: *Stenophyllus antillanus* Britton in Bull. Torrey Bot. Club 43: 447. 1916.

Type: *Lloyd 822*, Dominica.

Syn.: *Bulbostylis antillana* (Britton) Fernald in *Rhodora* 40: 392. 1938; Kral in *Sida* 4: 100, f. 26. 1971.

Bulbostylis capillaris sensu C. B. Clarke in Urban, *Symb. Antill.* 2(1): 88. 1900, with regard to Martinique specimen, non C. B. Clarke, 1893.

Slender short-lived perennial, densely tufted in clumps without a conspicuous rhizome. Culms wiry, 15–40 cm. tall, ca. 0.5 mm. wide, obtusely trigonous, smooth. Leaves filiform, $\frac{1}{2}$ to $\frac{2}{3}$ as long as the culms, 0.3–0.5 mm. wide, canaliculate, subrigid, several-costate on abaxial surface, spinulose-ciliate on margins with tubercle-based hairs, subacute at apex; sheaths 1–6 cm. long, much wider than the blade, ventrally thinly membranous, cinnamon-brownish or pale brown, the orifice oblique, densely ciliate with long crisped white cottony hairs. Corymbs simple or congested in a head, crowded with 1 to few short rays, up to 2 cm. long, 1 cm. wide; bracts 1 to 3, setaceous, the base dilated, hairy-margined, the lowest only surpassing the corymb and 2 to 4 times as long as the corymb; rays 0 to 3, up to 1 cm. long, terminated by 1 to 4 spikelets. Spikelets lanceolate or lance-oblong, 5–7 mm. long, ca. 1.5 mm. wide, acute, 8- to 15-flowered, polygonal with prominent keels of glumes, brown. Glumes subdensely spirally imbricated, ovate, 2 mm. long, deeply boat-shaped with a pronounced keel, the sides membranous brown to rusty brown and especially richly so on both sides of the keel, roughened throughout, ciliate on hyaline margins, the keel straw-colored, ending in a mucro at the very apex of the glume. Achenes broadly obovate, 0.7–0.8 mm. long, trigonous, contracted to apex, yellowish-brown at maturity, papillose and weakly rugose; style 1.3 mm. long, 3-cleft to $\frac{1}{2}$ – $\frac{2}{3}$ from apex; style-base conical, 0.2 mm. long.

GENERAL DISTRIBUTION: Endemic to the Lesser Antilles.

DISTRIBUTION IN LESSER ANTILLES: Iles des Saintes!, Dominica!, Martinique!, St. Lucia!

2. ***Bulbostylis barbata* (Rottb.) C. B. Clarke in Hook. f., Fl. Brit. Ind. 6: 651. 1893; Kral in *Sida* 4: 84, f. 10. 1971.**

Basionym: *Scirpus barbatus* Rottb., Descr. Icon. Rar. Nov. Pl. 52, t. 17, f. 4. 1773.

Type: Koenig, India, Malabar.

Syn.: *Bulbostylis fimbriata* (Nees) C. B. Clarke in Urban, Symb. Antill. 2(1): 87. 1900.

Oncostylis fimbriata Nees in Mart., Fl. Brasil. 2(1): 88. 1842. (Type locality: Brazil, Minas Gerais.)

Densely tufted annual without rhizome. Culms slender, erect, 5–30 cm. tall, 0.5–0.8 mm. thick, leaved at base. Leaf blades filiform, 4–10 cm. long, 0.5–0.8 mm. wide, acute at apex, glabrous or at times sparsely pilose on lower surface; sheaths 5–20 mm. long, membranous, brownish, glabrous, the white-hyaline orifice with scattered long hairs. Inflorescence a terminal head of 2–15 sessile spikelets, 5–12 mm. across, eventually brownish. Bracts 2 or 3, spreading, 1.0–2.5 cm. long, setaceous, glabrous or with scattered hairs on lower surface. Spikelets lanceolate to ovate-lanceolate, 3–8 mm. long, 1–2 mm. wide, angular, suddenly subacute at apex, subdensely 7- to 15-flowered, pale brownish. Glumes ovate, 1.7–2.0 mm. long with a recurved short awn, membranous, yellowish-green and eventually pale brownish, keeled, ciliate, occasionally puberulent on upper part. Achenes obovate-orbicular, trigonous, 0.60–0.75 mm. long, pale, smoothish, obscurely trabeculate with transversely rectangular cells, rounded to apex; style-base depressed-globular; style filiform; stigmas 3.

GENERAL DISTRIBUTION: Pantropic.

DISTRIBUTION IN LESSER ANTILLES: Martinique!.

3. *Bulbostylis pauciflora* (Liebmann) C. B. Clarke in Kew Bull. Add. Ser. 8: 26. 1903; Kral in Sida 4: 88, f. 15. 1971.

Basionym: *Oncostylis pauciflora* Liebm. in Vidensk. Selsk. Skr. 5(2): 241. 1851.

Type locality: St. Croix, West Indies.

Filiform perennial, densely tufted with often obliquely ascending rhizome clothed with brown remnants of leaf sheaths. Culms 7–20 cm. tall, up to 0.25 mm. wide, trigonous, smooth, prominently ribbed. Leaves $\frac{1}{2}$ as long as to equaling the culms, filiform, 0.2–0.4 mm. wide, 3-ribbed, folded or involute, somewhat triquetrous in cross section, spinulose-scabrous on margins, subacute at apex; sheaths ca. 1 cm. long, thinly membranous except for the dorsal side, light brown, the obliquely truncate orifice subdensely pilose with weakly crisped white hairs. Inflorescence of 1 or 2 (rarely 3) spikelets, the lowest sessile, the upper one(s) pedicelled and radiate, quasi-lateral with the erect lowest bract continuing down to the culm; bracts about 3, the lowest 2–5 cm. long, the remainder as long as or shorter than the sessile spikelet; pedicel(s) of spikelet(s), when present, 0.5–2.0 cm. long. Spikelets lanceolate to lance-ovate, acute, 5–7 mm. long, 1.5–2.0 mm. wide, pale brownish, 5- to 10-flowered, weakly laterally flattened. Glumes irregularly distichous, ovate or narrowly ovate, 2.0–2.8 mm. long, acute, folded, with an acute keel, thinly membranous, pale brownish and occasionally



FIGURE 54. Cyperaceae. a-g, *Bulbostylis pauciflora*: a, b, habit; c, spikelet; d, e, lateral and dorsal views of floral glume; f, ventral view of achene; g, achene with style. Bar scales (for floral parts) = 1 mm.

stained with deep brown on both sides of midvein, minutely brown-lineolate, 3-nerved, the keel green, ending in a mucro at glume apex. Achenes obovate, 1.3-1.5 mm. long, trigonous, pale brown, roughly transversely rugose; style ca. 1.5 mm. long, 3-cleft above for $\frac{1}{2}$ its length; style-base conical, 0.25 mm. long, dark brown.

GENERAL DISTRIBUTION: Endemic to the West Indies (Cuba, Puerto Rico, Haiti, and the Lesser Antilles).

DISTRIBUTION IN LESSER ANTILLES: Anguilla!

CYPERUS Linnaeus

Cyperus L., Gen. Pl. 12. 1737; Sp. Pl. 1: 44. 1753.

FIGURE 55.

Spikelets with few to many glumes distichously (or rarely in part obscurely spirally) imbricated on a continuous simple axis (rhachilla) which is prophyllate at base. Glumes all similar, bearing an axillary bisexual flower (often lacking in the lowest glume), the base sometimes decurrent along the angles of the rhachilla, and in this case the rhachilla winged between glumes. Flowers consisting of a pistil and 1-3 stamens; hypogynous bristles absent. Achenes trigonous or dorsiventrally lenticular; style not jointed at base, 2- or 3-fid at apex; stigmas 2 or 3.

Annual or perennial sedges, sometimes with short or stoloniferous rhizome. Culms not nodose above the leafy base, trigonous or triquetrous, solid, terminated by a single corymbose inflorescence, surrounded at the base with few to several sheaths which may or may not be bladed. Leaf blades usually developed, linear, 1- or 3-costate, truly dorsiventral.

TYPE SPECIES: *Cyperus esculentus* L.

A cosmopolitan genus with about 500 species.

KEY TO THE SPECIES

1. Stigmas 3; achenes 3-sided. 2
- 1a. Stigmas 2; achenes dorsiventrally lenticular. 15
2. Spikelets spicately disposed on a conspicuously elongated rhachis, thus forming spikes. 3
- 2a. Spikelets digitately disposed or capitately congested at apices of corymb rays, thus forming heads without a conspicuous rhachis. 8
3. Rhachilla of spikelets winged with base of glumes, which is decurrent along the rhachilla internode. 4
- 3a. Rhachilla of spikelets not winged. 6. *C. compressus*
4. Plants with creeping rhizomes or stolons. 5
- 4a. Plants without creeping rhizomes or stolons. 7
5. Culms conspicuously 3-sided, not septate; leaves with elongated blade; rhizome emitting slender stolons. 6
- 5a. Culms subterete, transversely septate, clothed at base with bladeless sheaths only; rhizome creeping. 1. *C. articulatus*
6. Leaves with a short ligule; glumes 1.6-2.2 mm. long. 2. *C. esculentus*
- 6a. Leaves without a ligule; glumes 3.0-3.2 mm. long. 3. *C. rotundus*
7. Spikelets linear-lanceolate, 1.2-1.5 mm. wide, distinctly flattened with two

- acute edges; glumes 2.0-2.5 mm. long, straw-colored, subacute; culms slender, not thickened at base. 4. *C. sphacelatus*
- 7a. Spikelets linear, 0.8-1.0 mm. thick, subterete; glumes 1.8-2.0 mm. long, sanguineous-brown, obtuse; culms rather robust, with a cornlike enlargement at base. 5. *C. distans*
8. Leaves with elongated blades. 9
- 8a. Leaves reduced to bladeless sheaths only. 14
9. Leaf blades thin and flat; plants not glutinous. 10
- 9a. Leaf blades thick, more or less semicircular in cross section; leaves and culms glutinous. 13
10. Stamens 3; achenes obovate-orbicular, triquetrous with concave sides; spikelets turgid. 7. *C. diffusus* subsp. *chalaranthus*
- 10a. Stamens 1; achenes oblong, oblong- or ovate-elliptic, trigonous with more or less convex sides; spikelets strongly flattened. 11
11. Spikelets whitish-brown; leaves deep green, up to 6 mm. wide. . 8. *C. luzulae*
- 11a. Spikelets light yellow- or grey-green; leaves light green, up to 4 mm. wide. 12
12. Spikelets oblong, 6-14 mm. long, grey-green. 9. *C. ochraceus*
- 12a. Spikelets lance-oblong to ovate, 3-6 mm. long, yellow-green. 10. *C. surinamensis*
13. Floral glumes elliptic, 3.5-4.0 mm. long. 11. *C. oxylepis*
- 13a. Floral glumes ovate-oval, 2.0-2.5 mm. long. 12. *C. elegans*
14. Inflorescence an open corymb with many rays; culms 50-150 cm. tall, tufted. 13. *C. alternifolius* subsp. *flabelliformis*
- 14a. Inflorescence a head; culms 25-50 cm. tall, standing in a row. 14. *C. nudicaulis*
15. Culms 90-120 cm. tall; leaves long-bladed; inflorescence an open corymb. 15. *C. alopecuroides*
- 15a. Culms 10-45 cm. tall; leaves reduced to bladeless sheaths; inflorescence a head. 16. *C. laevigatus*

1. *Cyperus articulatus* L., Sp. Pl. 1: 44. 1753; Griseb., Fl. Br. W. Ind. Isl. 564. 1864; C. B. Clarke in Urban, Symb. Antill. 2(1): 33. 1900; Kükenthal in Das Pflanzenr. IV, 20(Heft 101): 77. 1936.

Type locality: Jamaica.

Syn.: *Cyperus nodosus* Willd., Enum. Hort. Berol. 72. 1809. (Type locality: Peru.)
Cyperus articulatus L. var. *nodosus* (Willd.) Kükenthal in Das Pflanzenr. IV, 20 (Heft 101): 79. 1936.

Rhizome long, creeping, clothed with brown or red-brown scales. Culms arranged in a row along the rhizome, spaced or rather close together, 30-200 cm. tall, 2-10 mm. thick, terete, conspicuously transversely septate when dry. Leaves reduced to subaphyllous sheaths at base of culm, 3-25 cm. long, stained purplish-grey or purple-brown, oblique at orifice, developing short blades in dry habitats. Inflorescence a subterminal, open, compound corymb, 4-15 cm. long, 3-10 cm. wide; bracts 2 or 3, scalelike or spathaceous, 8-15 mm. long; rays 4-14, up to 12 cm. long, slender, unequal; secondary corymbs often developing 1-3 filiform raylets up to 3 cm. long. Spikes broadly ovoid, bearing 5-15 spikelets on short (2-5 mm. long) rhachis. Spikelets patent to spreading, linear, 1-4 cm. long, 1.0-1.5 mm. wide, weakly compressed, straw- to reddish-brown, subdensely 10- to 40-

flowered; rhachilla winged with hyaline, lanceolate, decurrent bases of glumes. Glumes ovate-elliptic to lance-ovate, 2.5-3.0 mm. long, subobtusate at apex, thinly membranous, reddish-brown or straw-colored, pale and scabrous on margin, slenderly 2-veined on both sides of a greenish costa ending below the glume apex. Achenes obovate-oblong, 3-sided, 1.00-1.25 mm. long, maturing dark brown; style ca. 3 mm. long, 3-cleft above for $\frac{2}{3}$ its length; stigmas 3.

GENERAL DISTRIBUTION: Tropical and subtropical regions of both hemispheres, abundant in Africa and rather scarce in Asia.

DISTRIBUTION IN LESSER ANTILLES: St. Barts!, Nevis!, Antigua, Guadeloupe, Martinique, St. Lucia!.

2. *Cyperus esculentus* L., Sp. Pl. 1: 45. 1753; Griseb., Fl. Br. W. Ind. Isl. 565. 1864; Duss in Ann. Inst. Col. Marseille 3: 540. 1897; C. B. Clarke in Urban, Symb. Antill. 2(1): 33. 1900; Kükenthal in Das Pflanzenr. IV, 20(Heft 101): 116, f. 14. 1936.

Type locality: Italy, Monspeli, and India.

Syn.: *Cyperus phymatodes* Muhl., Descr. uber. Gram. 23. 1817. (Type locality: North America.)

Cyperus cubensis Steud., Syn. Pl. Glum. 2: 42. 1855. (Type locality: Cuba.)

Cyperus esculentus L. var. *leptostachys* Böckl. in Linnaea 36: 290. 1870.

Cyperus esculentus L. var. *macrostachya* Böckl. in Linnaea 36: 291. 1870.

Slender perennial with fibrous roots; stolons filiform, elongate, covered with light brownish scales, terminated by a small tuber. Culms solitary, 10-50 cm. tall, slender, trigonous, smooth, thickened at base with a small cormlike enlargement clothed with brown fibers. Leaves radical, several to a culm; blades narrowly linear, 3-6 mm. wide, shorter than to surpassing the culms, flattish or slightly recurved; ligule absent; sheaths red-brown, integrating into fibers. Inflorescence a loose umbellike corymb, simple or in part compound, 4-7 cm. long and as wide; involucre bracts 3-6, leaflike, patent, the lower 1 or 2 surpassing the inflorescence; rays slender, 5-8, patent, 1-4 cm. long. Spikes ovoid, loosely bearing 5-14 spikelets. Spikelets linear-oblong to oblong, 5-12 mm. long, 2 mm. wide, slightly compressed, 8- to 16-flowered, yellow-brown or light brown; rhachilla winged. Glumes suberect, ovate or ovate-elliptic, 1.6-2.2 mm. long, membranous, yellow- or reddish-brown, pale-hyaline on upper margins, obtuse at apex, 7-nerved (including a midvein), the keel obtuse. Achenes obovate or oblong-obovate, 1.50-1.75 mm. long, obtusely trigonous, greyish-brown, shiny, minutely punctulate; style 3-cleft.

GENERAL DISTRIBUTION: Cosmopolitan.

DISTRIBUTION IN LESSER ANTILLES: Martinique!.

This common weed has been documented from the Lesser Antilles only by two historical collections from Martinique, *Duss* 470 and 4512 (GH!). No contemporary collection has been noted.

3. *Cyperus rotundus* L., Sp. Pl. 1: 45. 1753; Griseb., Fl. Br. W. Ind. Isl. 564. 1864; C. B. Clarke in Urban, Symb. Antill. 2(1): 34. 1900; Kükenthal in Das Pflanzenr. IV, 20(Heft 101): 107, f. 13. 1936.

Type locality: India.

Syn.: *Cyperus purpureo-variegatus* Böckl., Cyp. Nov. 2: 37. 1980; Duss in Ann. Inst. Col. Marseille 3: 539. 1897. (Type: *Duss 449*, Martinique.)

Perennial with long, slender, stoloniferous rhizome terminated by a globose-ovoid tuber. Culms solitary or few together, bearing a cormlike enlargement at base, erect, 10-40(rarely up to 60) cm. tall, slender, triquetrous, smooth, leaved at base. Leaves few, much shorter than the culm; blades linear, 2-5 mm. wide, folded; ligule very short; sheaths light brown, eventually disintegrating into brown parallel fibers. Corymbs simple to compound, loose, with 2-10 slender rays of unequal length; rays 1-8(-12) cm. long, patent; spikes turbinate, with rather short rhachis, subloosely bearing 3-10 spikelets; leafy bracts usually 2 or 3(rarely to 5), the lowest one 2-3 times as long as the corymb, the second slightly surpassing the corymb, the remaining bracts setaceous. Spikelets spreading to patent, linear, 1-3 cm. long, (1.5-)2.0-3.0 mm. wide, subcompressed with acute edges, subdensely 8- to 28-flowered, sanguineous-brown; rhachilla with relatively broad, white-hyaline wings. Glumes ovate to ovate-elliptic, 3.0-3.2 mm. long, folded, with subacute keel, membranous, sanguineous- or slightly purplish-brown, 5- or 7-nerved with weak lateral veins, the apex obtuse or subdensely mucronate, more or less recurved; the keel greenish. Achenes oblong, 3-sided, 1/3-2/5 the length of the glume, maturing brown, minutely punctulate; style elongate; stigmas 3. Stamens 3.

GENERAL DISTRIBUTION: Cosmopolitan.

DISTRIBUTION IN LESSER ANTILLES: Anguilla!, St. Barts!, Guadeloupe!, Dominica!, Martinique, St. Vincent!, Barbados!.

4. *Cyperus sphacelatus* Rottb., Descr. Icon. Rar. Nov. Pl. 26. 1773; Griseb., Fl. Br. W. Ind. Isl. 565. 1864; Duss in Ann. Inst. Col. Marseille 3: 538. 1897; C. B. Clarke in Urban, Symb. Antill. 2(1): 30. 1900.

Type: *Rolander*, Surinam.

Syn.: *Cyperus balbisii* Kunth, Enum. Pl. 2: 63. 1837. (Type: *Bertero*, Santo Domingo.)

Herb, assumed to be an annual. Culm tufted, 20-60 cm. tall, slender, smooth, triquetrous. Leaves few to a culm, narrowly linear, 2-4 mm. broad, 1/2-2/3 as long as the culm, plicate; sheath brownish. Corymb open, subloose, simple to compound, 4-10 cm. long, 4-14 cm. wide; leafy bracts 3-5, patent, the lowest 1 or 2 much surpassing the corymb; rays 3-8, patent, slender, unequal, up to 8 cm. long; spikes broadly ovate in outline, loosely bearing 5-12 spikelets on rather short rhachis. Spikelets spreading, linear-lanceolate, acute, 6-20 mm. long, 1.2-1.5 mm. wide, flattened, acute at apex, straw-colored with sanguineous flecks, 10- to 24-flowered; rhachilla slender, weakly flexuose, winged with caducous, white-hyaline base of glumes.

Glumes lance-ovate to ovate, 2.0-2.5 mm. long, subobtusate to subacute at usually mucronate apex, the pale membranous sides with sanguineous stain on both sides of keel, dorsally 5- to 9-nerved, the keel greenish. Achenes obovate, 1.0-1.2 mm. long, triquetrous with concave sides, maturing brown; style 1.5 mm. long, 3-cleft above for $\frac{1}{3}$ its length. Stamens 3.

GENERAL DISTRIBUTION: Tropical Africa and tropical America; recently introduced to Ceylon and Malesia.

DISTRIBUTION IN LESSER ANTILLES: St. Kitts, Montserrat!, Guadeloupe, Dominica!, Martinique!, St. Lucia!, St. Vincent!, Grenada.

5. *Cyperus distans* L. f., Suppl. Sp. Pl. 103. 1781; Griseb., Fl. Br. W. Ind. Isl. 565. 1864; Duss in Ann. Inst. Col. Marseille 3: 540. 1897; C. B. Clarke in Urban, Symb. Antill. 2(1): 32. 1900; Kükenthal in Das Pflanzenr. IV, 20(Heft 101): 137. 1936.

Type locality: "India orientali."

Perennial with small cormlike rhizome. Culms solitary or few together, often rather slender, 35-100 cm. tall, triquetrous, thickened at base. Leaves shorter than the culm; blades linear, 4-6 mm. wide, weakly folded, herbaceous; sheaths rather elongated, light brown. Corymb compound to decompound; leafy bracts 4-6, the lower 2 or 3 surpassing the corymb; rays 5-10, unequal, 1-15 cm. long, patent; secondary corymbs with short raylets or bearing 4-8 subsessile spikes. Spikes loose, broadly ovate in outline, distantly bearing 8-20 spikelets. Spikelets divergent, linear, 8-40 mm. long, 0.8-1.0 mm. wide, cylindrical, 8- to 32-flowered; rhachilla winged. Glumes distantly disposed on weakly zigzag rhachilla, elliptic, 1.8-2.0 mm. long, obtuse at apex, membranous, sanguineous-brown on both sides, 3- to 5-nerved near the keel, white-hyaline on upper margin, the keel greenish, hardly reaching the glume apex, the base decurrent along the rhachilla, forming caducous white-hyaline wings. Achenes oblong to oblong-elliptic, 3-sided, ca. $\frac{2}{3}$ the length of the glume, maturing dark brown, minutely punctulate; style short; stigmas 3. Stamens 3.

GENERAL DISTRIBUTION: Pantropic.

DISTRIBUTION IN LESSER ANTILLES: St. Kitts, Antigua, Guadeloupe!, Dominica, Martinique, St. Vincent!.

6. *Cyperus compressus* L., Sp. Pl. 1: 46. 1753; Griseb., Fl. Br. W. Ind. Isl. 562. 1864; C. B. Clarke in Urban, Symb. Antill. 2(1): 31. 1900; Kükenthal in Das Pflanzenr. IV, 20(Heft 101): 156, f. 4A-D. 1936.

Type locality: North America.

Syn.: *Cyperus compressus* L. var. *capillacea* [sic!] C. B. Clarke in Urban, Symb. Antill. 2(1): 32. 1900. (Type: *Imray 430*, Dominica.)

Tufted annual with fibrous roots only. Culms patent, 8-35 cm. tall, relatively stout, 3-sided, smooth. Leaves few to a culm; basal; blades linear, flat, 1-3 mm. wide, shorter than the culms, light green; sheaths membra-

nous, pale brownish, striate. Inflorescence umbelliform or congested, 2-10 cm. long, 2-10 cm. wide; involucre bracts 2-4, leaflike, unequal in length, the longest one 2 or 3 times as long as the inflorescence; rays (when present) 2-5, patent, 0.8-5.0 cm. long, slightly compressed. Spike bearing 3-10 spikelets on abbreviated axis, oval or somewhat flabelliform, 3 cm. long. Spikelets lance-oblong, 10-25 mm. long, 2.5-3.0 mm. wide, 15- to 40-flowered, compressed, greenish and turning straw-colored at maturity; rhachilla not winged. Glumes ovate or broadly so, 3.0-3.5 mm. long, herbaceous or thinly coriaceous; strongly folded with acute keel, 3-nerved on both sides, the keel green, finely many-veined, the apex acute with a straight mucro ca. 0.8 mm. long. Achenes 1.00-1.25 mm. long, broadly obovate, 3-sided, dark brown, shiny, minutely punctulate; style elongate, 3-fid at apex.

GENERAL DISTRIBUTION: Cosmopolitan weed distributed in tropical, subtropical and warm-temperate regions of the world.

DISTRIBUTION IN LESSER ANTILLES: Dominica!, Martinique, St. Vincent.

7. *Cyperus diffusus* Vahl, Enum. Pl. 2: 321. 1806, subsp. *chalaranthus* (Presl) Kükenthal in Das Pflanzenr. IV, 20(Heft 101): 210. 1936.

Basionym: *Cyperus chalaranthus* Presl, Rel. Haenk. 1: 177, t. 32, f. 1. 1828.

Type locality: Peru and Mexico.

Syn.: *Cyperus elegans* sensu Swartz, Obs. Bot. 30. 1791; Duss in Ann. Inst. Col. Marseille 3: 536. 1897, non L.

Cyperus laxus sensu Griseb., Fl. Br. W. Ind. Isl. 563. 1864, non Lam.

Cyperus diffusus sensu C. B. Clarke in Urban, Symb. Antill. 2(1): 30. 1900.

Perennial. Culms erect, rigid, 30-90 cm. tall, trigonous, smooth, with a cormlike lignescent enlargement at base. Leaves several, shorter than to equaling the culm, linear, 5-10 mm. wide, flattish, 3-costate, rather abruptly acute at apex; sheaths with red-brown wings more or less disintegrating into brown fibers. Corymbs decompound, often ample, diffuse; leafy bracts 7-12, linear, 4-12 mm. wide, the lower ones $1\frac{1}{2}$ -2 times as long the corymb, the shorter ones $\frac{1}{2}$ - $\frac{1}{3}$ the length of corymb; primary rays 8-17, rather unequal, patent, 10-23 cm. long; secondary corymbs 3-5 cm. long, the setaceous bracteoles up to 4 cm. long, surpassing the sessile cluster of spikelets. Spikelets sessile in clusters of 3-12, linear to linear-oblong, 7-12 mm. long, 2-3 mm. wide, slightly turgid, (8- to) 15- to 32-flowered, greenish and tinged with straw-brown; rhachilla with narrow wings. Glumes oval to ovate-oval, 2.0-2.5 mm. long (including awn), ca. 1.6 mm. wide, thinly membranous, pale and often brownish-flecked, slenderly 2-veined on both sides of keel, the greenish keel broad, 3- or 5-nerved, projecting beyond the glume apex forming a straight awn ca. 0.5 mm. long. Achenes obovate-orbicular, 1.50-1.75 mm. long, ca. 1 mm. wide, triquetrous with shallowly concave sides, contracted at apex, maturing brown; style very short; stigmas 3, 1 mm. long.

GENERAL DISTRIBUTION: Central and South America.

DISTRIBUTION IN LESSER ANTILLES: Martinique, St. Vincent!, Grenada!.

Differences between American subsp. *chalaranthus* and tropical Asiatic subsp. *diffusus* have been variously interpreted. In my opinion the most significant difference exists in the secondary corymbs. In subsp. *chalaranthus* the more contracted secondary corymbs bear a large glomerule of 10 to 17 spikelets and generally only 1 to 3 elongated raylets, each terminated by a glomerule of sessile spikelets, and the bracteoles of both secondary and tertiary corymbs surpass their subtending glomerules of spikelets. In subsp. *diffusus*, however, the open secondary corymbs bear (4 or) 5 to 12 slender raylets, which are terminated by either 1 to 3 digitate spikelets or an open, small tertiary corymb, and the much-reduced bracteoles are up to $\frac{1}{2}$ the length of the subtending raylets. In addition, the floral glumes of subsp. *chalaranthus* are pale and distinctly awned, whereas those of subsp. *diffusus* are colored with rusty brown and only mucronate at the apex. In most specimens, the longer primary rays of subsp. *chalaranthus* attain 20 to 23 cm. in length, while the longer rays in subsp. *diffusus* hardly exceed 10 cm. in length. These differences are consistent in ample collections from Asia and the Americas that have been examined. I therefore recognize subsp. *chalaranthus* as a valid taxon.

8. *Cyperus luzulae* (L.) Retz., Obs. Bot. 4: 11. 1786; Griseb., Fl. Br. W. Ind. Isl. 564. 1864; Duss in Ann. Inst. Col. Marseille 3: 537. 1897; C. B. Clarke in Urban, Symb. Antill. 2(1): 27. 1900; Kükenthal in Das Pflanzenr. IV, 20(Heft 101): 170. 1936.

Basionym: *Scirpus luzulae* L., Sp. Pl. ed. 2. 75. 1762.

Type locality: Mistakenly cited as "India orientali" by Linnaeus, Vahl, Kunth, and others. It is, in fact, assumed to be from the West Indies or Surinam.

Syn.: *Cyperus trinitatis* Steud., Syn. Pl. Glum. 2: 26. 1855. (Type: Sieber 1, Trinidad.)

Rhizome very short. Culms stout, 20-60 cm. tall, 3-5 mm. thick below, trigonous, smooth. Leaves shorter than to slightly overtopping the culm, linear, herbaceous, 3-6 mm. wide, flattish, gradually narrowed to long acute apex; sheaths straw-brown and stained with red-purple, hardly disintegrating. Corymbs compound, open, 3-8 cm. long, 5-10 cm. wide; leafy bracts 7-10, spreading to reflexed, the longer ones up to 30 cm. long; primary rays patent, 2-7 cm. long, rigid; secondary corymbs congested in more or less lobed head 1-2 cm. long and as wide; bracteoles inconspicuous. Spikelets densely disposed, ovate, 3-4 mm. long, 2.0-2.5 mm. wide, flattened, subacute at apex, 5- to 20-flowered, whitish; rhachilla not winged. Glumes patent and weakly incurved, oblong-ovate to oblong-elliptic, obtuse, 1.2-1.4 mm. long, membranous, pale brownish to whitish, minutely reticulate, inconspicuously 1-veined on both sides, the slender brownish keel ending below glume apex. Achenes oblong-elliptic, 0.75 mm. long, trigonous, maturing dark brown, punctulate; style 0.8 mm. long, filiform, 3-cleft above for $\frac{1}{4}$ its length.

GENERAL DISTRIBUTION: Tropical America, from the West Indies and Mexico south to Ecuador and Paraguay.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe, Dominica, Martinique!, St. Lucia!, St. Vincent!, Grenada!.

9. *Cyperus ochraceus* Vahl, Enum. Pl. 2: 325. 1806; Griseb., Fl. Br. W. Ind. Isl. 563. 1836; Duss in Ann. Inst. Col. Marseille 3: 537. 1897; C. B. Clarke in Urban, Symb. Antill. 2(1): 27. 1900; Kükenthal in Das Pflanzenr. IV, 20(Heft 101): 182. 1936.

Type: *West*, St. Croix.

Herb, tufted with short rhizome. Culms 20–60 cm. tall, rather slender, stiff, triquetrous, smooth. Leaves narrowly linear, shorter than to slightly surpassing the culm, 2–4 mm. wide, herbaceous; sheaths flattish-plicate, greenish and stained with light brown. Corymbs simple or in part compound, 4–7 cm. long, 3–8 cm. wide; leafy bracts 4–7, most of them 2–3 times as long as the corymb; rays 4–12, slender, up to 8 cm. long, terminated by 1–3 heads of spikelets; heads spherical, 1–2 cm. across, bearing 4–30 spikelets. Spikelets oblong to narrowly oblong, 6–14 mm. long, 2–3 mm. wide, moderately compressed, greyish-green, suddenly subacute at apex, 10- to 26-flowered; rhachilla not winged. Glumes subdensely disposed, eventually more or less spreading, ovate or deltoid-ovate, 1.5 mm. long, subacute, herbaceous on both sides, subcoriaceous in median area, minutely reticulate, pale and tinged with brown on both sides, the grey-green keel 3-nerved, subacute toward mucronulate apex. Achenes ovate-elliptic, nearly 1 mm. long, acute at both ends, triquetrous with convex sides, maturing dark brown, minutely porate-punctulate; style ca. 1 mm. long, slightly fimbriate, 3-cleft above for $\frac{1}{3}$ its length. Stamen 1.

GENERAL DISTRIBUTION: Subtropical and tropical America, from southern United States south to northern Argentina.

DISTRIBUTION IN LESSER ANTILLES: Antigua!, Guadeloupe.

10. *Cyperus surinamensis* Rottb., Descr. Icon. Rar. Nov. Pl. 35, t. 6, f. 5. 1773; Griseb., Fl. Br. W. Ind. Isl. 564. 1864; Duss in Ann. Inst. Col. Marseille 3: 537. 1897; C. B. Clarke in Urban, Symb. Antill. 2(1): 26. 1900; Kükenthal in Das Pflanzenr. IV, 20(Heft 101): 174. 1936.

Type: *Rolander*, Surinam.

Syn.: *Cyperus formosus* Vahl, Enum. Pl. 2: 327. 1806. (Type localities: Louisiana and Caribaea.)

Cyperus surinamensis Rottb. var. *lutescens* Böckl. in Linnaea 35: 555. 1868.

Cyperus surinamensis Rottb. var. *formosus* (Vahl) Kükenthal in Fedde Rep. Sp. Nov. 32: 74. 1933.

Rhizome short with rather stout roots. Culms tufted, 30–60 cm. tall, triquetrous, retrorsely scabrous on angles except at base, light green. Leaves nearly equaling the culm, narrowly linear, 2–4 mm. wide, flattish-

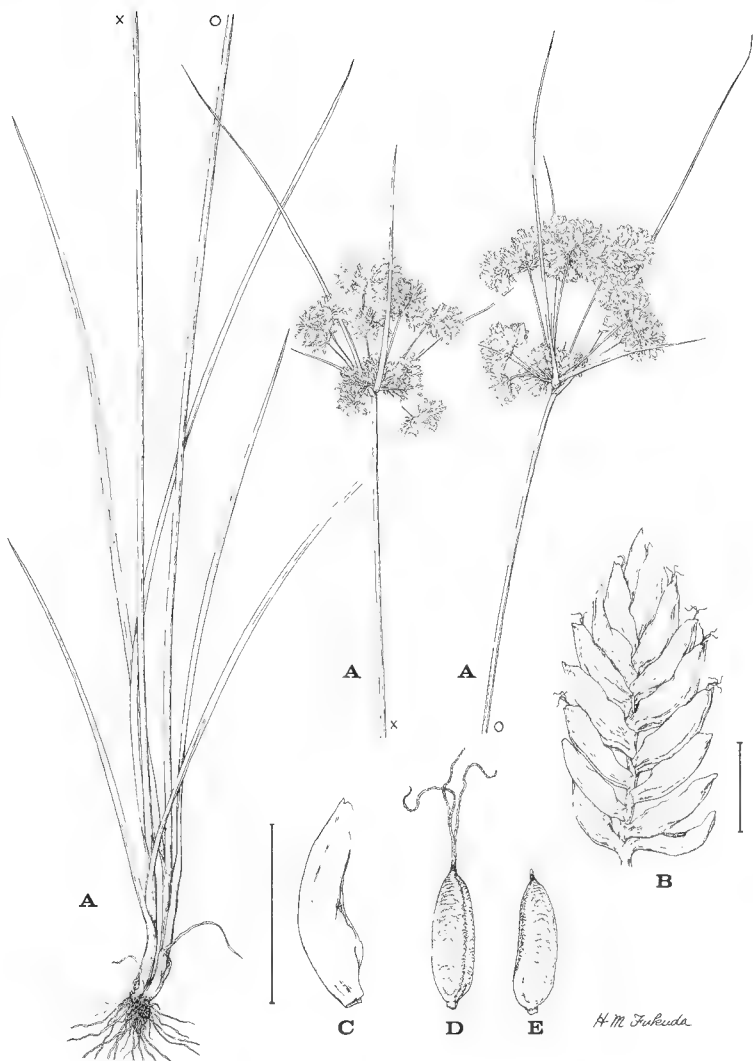


FIGURE 55. Cyperaceae. a-e, *Cyperus surinamensis*: a, habit; b, spikelet; c, lateral view of floral glume; d, dorsal view of achene with style; e, ventral view of achene. Bar scales (for floral parts) = 1 mm.

plicate, herbaceous, whitish-green, gradually narrowed to long acute apex; sheaths pale green and tinged with cinnamon- or purple-brown. Corymb open, compound, 5-11 cm. long, 4-10 cm. wide; leafy bracts 4-7, lower ones much surpassing the corymb; rays 6-15, very unequal, patent, rather slender, up to 7 cm. long; secondary corymbs bearing 3-9 heads and 3-6 raylets, 2-3 cm. long, 3-5 cm. wide. Spikelets lance-oblong to ovate, acute, 3-6 mm. long, 2.0-2.5 mm. wide, flattened, 10- to 24-flowered, light yellow-green; rhachilla not winged. Glumes closely disposed, lance-oblong to ovate-oblong, 1.2-1.4 mm. long, incurved, rather suddenly subacute at apex, thinly membranous, minutely reticulate, pale green with straw-colored stains, the greenish 3-nerved costa forming a minute mucro at glume apex. Achenes oblong, trigonous, 0.5-0.6 mm. long, maturing black, densely punctulate; style 1 mm. long, 3-cleft above for $\frac{2}{5}$ its length. Stamen 1.

GENERAL DISTRIBUTION: Subtropical and tropical America, from southern United States south to northern Argentina.

DISTRIBUTION IN LESSER ANTILLES: St. Martin, Guadeloupe, Dominica, Martinique, St. Lucia!, Grenada!.

11. *Cyperus oxylepis* Nees [in Linnaea 9: 285. 1835, nomen nudum] ex Steud., Syn. Pl. Glum. 2: 25. 1855; C. B. Clarke in Urban, Symb. Antill. 2(1): 29. 1900; Kükenthal in Das Pflanzenr. IV, 20(Heft 101): 165. 1936.

Type locality: Guiana.

Perennial, tufted with short rhizome. Culms 20-50 cm. tall, rigid, obtusely trigonous, sometimes more or less glutinous. Leaves few to a culm, shorter than to equaling the culm, the blade thick, semicircular in cross section, ventrally canaliculate, stiffish, cinereous-green, indistinctly septate-nodulose, gradually narrowed to the somewhat obtuse apex, the spinulose margins inrolled; sheaths straw-colored, septate-nodulose, the outer ones tinged with purplish-brown. Corymbs open, simple or subcompound, subdense, 6-12 cm. long, 5-9 cm. wide; leafy bracts 2-4, the lowest suberect, much surpassing the corymb; rays 3-8, very unequal, rigid, erect-patent, the longer ones up to 12(rarely to 15) cm. long; secondary corymbs, if formed, developing 1-3 raylets up to 2 cm. long. Spikes a spherical head bearing 5-20 spikelets, 1.0-2.5 cm. across. Spikelets linear-lanceolate, 1-2 cm. long, 3.0-3.5 mm. wide, flattened, 12- to 25-flowered, straw-colored; rhachilla not winged. Floral glumes subloosely disposed, elliptic, acute, 3.5-4.0 mm. long, folded, chartaceous, straw-colored or brown-tinged, 1- to 3-veined on both sides, the broad, 5-nerved costa cinereous-green, ending in a patulous mucro. Achenes oblong-elliptic, 2 mm. long, triquetrous with shallowly concave sides, attenuate at both ends, maturing dark brown with whitish punctication; style 1.5 mm. long, 3-cleft above for $\frac{1}{3}$ its length. Stamens 3.

GENERAL DISTRIBUTION: West Indies, northern and eastern South America from Guianas through Venezuela and Colombia southward to northern Argentina.

DISTRIBUTION IN LESSER ANTILLES: Anguilla!, St. Martin!, St. Barts!.

12. *Cyperus elegans* L., Sp. Pl. ed. 2. 68. 1762; C. B. Clarke in Urban, Symb. Antill. 2(1): 28. 1900; Kükenthal in Das Pflanzenr. IV, 20(Heft 101): 164. 1936.

Type locality: Jamaica.

Syn.: *Cyperus viscosus* Swartz, Prodr. 20. 1788; Fl. Ind. Occ. 1: 113. 1797; Duss in Ann. Inst. Col. Marseille 3: 537. 1897. (Type locality: Jamaica.)

Scirpus viscosus (Sw.) Lam., Ill. 1: 142. 1791.

Cyperus confertus sensu Griseb., Fl. Br. W. Ind. Isl. 563. 1864, pro majore parte, non Swartz.

Perennial, tufted with short rhizome and rather stout roots. Culms 30-60 cm. tall, obtusely trigonous to subterete, at times viscous. Leaves shorter than to nearly equaling the culm, 2-3 mm. wide, canaliculate, inrolled-margined, weakly septate-nodulose, glaucous-green, spinulose on margins, subobtuse at apex; sheaths pale green, the outer ones sometimes stained with sanguineous-brown. Corymbs open, compound, 8-15 cm. long, 5-9 cm. wide; leafy bracts 3 or 4, the 2 lowest $1\frac{1}{2}$ -3 times as long as the corymb, patent; primary rays 4-9, erect-patent, unequal, up to 10 cm. long, subrigid; secondary corymbs usually developing 1 or 2 raylets up to 3 cm. long; spikes a glomerule of 5-20 spikelets 1.5-3.0 cm. in diameter. Spikelets oblong, lance-oblong or ovate-elliptic, 5-15 mm. long, ca. 3 mm. wide, weakly compressed, 8- to 20-flowered, pale green and stained with brown; rhachilla not winged. Glumes ovate-oval, 2.0-2.5 mm. long, chartaceous, pale green and tinged with red-brown, 1- or 2-nerved on both sides of costa, the costa broad and forming an acute keel, inconspicuously several-veined, pale green, ending in a weakly recurved cusp ca. 0.5 mm. long. Achenes broadly obovate, 1.5 mm. long, triquetrous with slightly concave sides, maturing blackish; styles ca. 2 mm. long, 3-cleft above for $\frac{1}{2}$ its length.

GENERAL DISTRIBUTION: Southern United States, Central America, the West Indies; also sporadically noted from Peru and Argentina.

DISTRIBUTION IN LESSER ANTILLES: St. Martin!, Nevis!, Antigua, Guadeloupe!, La Desirade, Marie Galante!, Martinique!, St. Lucia!, St. Vincent!, Bequia.

13. *Cyperus alternifolius* L., Mant. Pl. 2: 28. 1771, subsp. *flabelliformis* (Rottb.) Kükenthal in Das Pflanzenr. IV, 20(Heft 101): 193. 1936.

Basionym: *Cyperus flabelliformis* Rottb., Descr. Icon. Rar. Nov. Pl. 42, t. 12, f. 2. 1773.

Type: Forsskal, Arabia.

Tall perennial with short, woody rhizome. Culms subdensely tufted, 50–150 cm. tall, obtusely trigonous to nearly terete below, scabrous below the corymb, clothed at base with bladeless sheaths only; basal sheaths pale greenish, 10–20 cm. long, obliquely truncate at orifice, the lower ones cataphylloid, yellow-brown. Corymbs ample, subdense, 15–30 cm. across, decompound; primary rays numerous, slender, 7–10 cm. long, each bearing 4–10 raylets 1.0–1.5 cm. long; leafy bracts many, nearly equal in length, ca. twice as long as the corymb, stiffish, flattish, 2–12 mm. wide, subabruptly acute at apex. Spikelets clustered at apices of raylets, lance-oblong to elliptic, flattened, 3–9 mm. long, 1.7–3.0 mm. wide, densely 6- to 30-flowered, light green; rhachilla not winged. Glumes ovate, acute at apex, 1.5–2.0 mm. long, membranous, pale green and variegated with rusty brown, 3- or 5-nerved, the keel prominent. Achenes obovate-elliptic, 3-sided, $\frac{1}{3}$ – $\frac{1}{4}$ as long as the glume, maturing brown; style nearly as long as the achene; stigmas 3, elongate. Stamens 3.

GENERAL DISTRIBUTION: Africa and Madagascar. Also widely cultivated as an ornamental both outdoors and in greenhouses.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe!, St. Lucia! (both records from cultivated material).

14. *Cyperus nudicaulis* Poir. in Lam., Encycl. Méth. Bot. 7: 240. 1806; C. B. Clarke in Urban, Symb. Antill. 2(1): 23. 1900; Kükenthal in Das Pflanzenr. IV, 20(Heft 101): 291. 1936.

Type locality: Madagascar.

Syn.: *Anosporum nudicaule* (Poir.) Böckl. [in Bot. Zeit. 27: 26. 1869, nomen nudum] in Linnaea 36: 411. 1870.

Aquatic perennial floating on water. Rhizome short. Culms closely arranged in a row along the rhizome, 25–50 cm. tall, less than 1 mm. thick, obtusely trigonous, smooth, clothed at base with 3 or 4 bladeless sheaths. Leaves reduced to sheaths only, the sheaths 2–15 cm. long, membranous, light brown to pale brown and stained with red-brown, obliquely truncate at cuspidate or mucronate apex. Inflorescence a head, or occasionally developing 1 to few short rays; bracts 1 or 2, subspathaceous, shorter than to equaling the head. Spikelets ovate to ovate-elliptic, 0.8–2.0 cm. long, 4–6 mm. wide, flattened, acute at apex, pale brownish; rhachilla flattened, 4-quetrous, not winged. Glumes closely disposed, ovate to lance-ovate, acute, 3–4 mm. long, folded with acute keel, herbaceous, minutely reticulate, brown to pale brown, 1-nerved on each side through $\frac{1}{2}$ its length, the broad hispidulous 3-nerved keel ending in a short mucro. Achenes lanceolate to lance-oblong, 2.8–3.0 mm. long, compressed-triangular, bearing a broad spongy wing on each angle, pale brown, gradually tapering above to acute apex; style ca. 2 mm. long, (2- or) 3-cleft above for $\frac{1}{4}$ its length.

GENERAL DISTRIBUTION: Tropical Africa and the Lesser Antilles.

DISTRIBUTION IN LESSER ANTILLES: Martinique!.

This African species is known from Martinique only through a single historical collection, *Duss* 479.

15. *Cyperus alopecuroides* Rottb., Descr. Icon. Rar. Nov. Pl. 38, t. 8, f. 2. 1773; Duss in Ann. Inst. Col. Marseille 3: 535. 1897; Kükenenthal in Das Pflanzenr. IV, 20(Heft 101): 71. 1936.

Type: *Forsskal*, Arabia.

Syn.: *Juncellus alopecuroides* (Rottb.) C. B. Clarke in Hook. f., Fl. Brit. Ind. 6: 595. 1893; in Urban, Symb. Antill. 2(1): 21. 1900.

Perennial with short, lignescent rhizome. Culms robust, 90–120 cm. tall, 1–2 cm. thick below, 3-sided. Leaves broadly linear, equaling to overtopping the culm, 6–15 mm. wide, coriaceous, 3-costate; sheath stained with red-brown. Corymbs ample, 20–30 cm. long, 13–20 cm. wide; bracts 4–7, leafy, the lower ones surpassing the corymb, 6–12 mm. wide; rays 5–10, unequal, rigid, erect to erect-patent, (8–)10–20 cm. long, weakly flattened; secondary corymbs subdense, bearing 3–5 sessile spikes and 2–4 raylets up to 5 cm. long; bracteoles shorter than the sessile spikes; spikes cylindrical to oblong-cylindrical, 1.5–4.0 cm. long, 10–15 mm. thick, densely bearing numerous spikelets. Spikelets patent to divergent, lance-oblong, 4–8 mm. long, 2–3 mm. wide, slightly turgid, subacute at apex, 10- to 30-flowered, yellowish; rhachilla flattened, very narrowly winged. Floral glumes ovate-oval, 2.0–2.5 mm. long, ca. 1.25 mm. wide, shallowly boat-shaped without conspicuous keel, acute at apex, membranous and yellowish and sanguineous-lineolate on both sides, the stramineous-green costa broad, inconspicuously 5- to 7-nerved, ending in a mucro at glume apex. Achenes thickly biconvex or plano-convex, obovate-elliptic, 0.6–0.8 mm. long, maturing straw-colored; style 1.5 mm. long, 2-cleft above for $\frac{1}{2}$ its length. Stamens 2 or 3.

GENERAL DISTRIBUTION: Pantropic.

DISTRIBUTION IN LESSER ANTILLES: Montserrat!, Nevis!, Guadeloupe!, Marie Galante!, St. Lucia!, Grenada!.

16. *Cyperus laevigatus* L., Mant. Pl. 2: 179. 1771; Kükenenthal in Das Pflanzenr. IV, 20(Heft 101): 321, f. 5E–H. 1936.

Type: *König*, Cape of Good Hope.

Syn.: *Juncellus laevigatus* (L.) C. B. Clarke in Hook. f., Fl. Brit. Ind. 6: 596. 1893; in Urban, Symb. Antill. 2(1): 21. 1900.

Cyperus mucronatus Rottb., Descr. Icon. Rar. Nov. Pl. 19, t. 8, f. 4. 1773; Griseb., Fl. Br. W. Ind. Isl. 562. 1864. (Type: *Forsskal*, Arabia.)

Leafless perennial; rhizome creeping, short or elongated, clothed with brownish scales. Culms arranged in a single row along the rhizome, remote or close together, 10–45 cm. tall, 3-sided, smooth, stoutish, clothed at base

with a few bladeless sheaths only. Sheaths 2 or 3, brown or dark brown, obliquely truncate at orifice, the uppermost sheath short-bladed or mucronate at orifice, the blade subulate, convolute, glaucous-green. Inflorescence pseudolateral, capitate with 1-12 sessile spikelets; bracts 2, the lower one erect, continuing to the culm, 3-8 cm. long, much exceeding the inflorescence, the lower one short, patent. Spikelets lance-oblong, slightly swollen, 7-12 mm. long, 2 mm. thick, 12- to 24-flowered, somewhat acute at apex, straw-colored; rhachilla tetragonal, not winged. Glumes closely disposed, broadly ovate, 2.00-2.25 mm. long, obtuse or mucronulate at apex, herbaceous, straw-colored, occasionally ferrugineous-striate, 3- to 5-nerved on dorsally depressed keel. Achenes obovate to ovate, 1.5 mm. long, dorsiventrally concave-convex, obtuse-tipped, greyish-brown, punctulate; style short, 2-fid.

GENERAL DISTRIBUTION: Mediterranean Region, Africa, India, Pacific Islands, Central and South America.

DISTRIBUTION IN LESSER ANTILLES: Anguilla!, Antigua, Nevis!.

PYCREUS P. Beauvois

Pycreus P. Beauv., Fl. d'Oware 2: 48, t. 86. 1807.

Spikelets with few to many glumes distichously disposed on a continuous simple axis (rhachilla), laterally flattened. Glumes all alike, bearing a bisexual flower at axil. Flowers consisting of a digynous pistil and 1-3 stamens, without hypogynous bristles. Achenes bilaterally flattened, lenticular, with one of the angles facing the rhachilla, the sides punctulate or undulate; style not jointed at base; stigmas 2.

Vegetative characters as in *Cyperus*.

TYPE SPECIES: *Pycreus polystachyos* (Rottb.) P. Beauvois, based on *Cyperus polystachyos* Rottb.

About 70 species in temperate, subtropical and tropical regions of the world, with a high concentration of species in Africa.

KEY TO THE SPECIES

1. Achenes zonate and transversely wrinkled with longitudinally oblong epidermal cells; spikelets lanceolate to lance-oblong, 2.0-2.5 mm. wide. 1. *P. flavescens*
- 1a. Achenes minutely punctulate or smoothish, with isodiametrical epidermal cells; spikelets linear to linear-lanceolate or linear-oblong. 2
2. Culms 20-50 cm. tall; glumes acute at apex. 2. *P. polystachyos*
- 2a. Culms 5-15 cm. tall; glumes truncate to emarginate at apex. ... 3. *P. pumilus*

1. *Pycreus flavescens* (L.) Reichenb., Fl. Germ. Excurs. 72. 1830; C. B. Clarke in Urban, Symb. Antill. 2(1): 16. 1900.

Basionym: *Cyperus flavescens* L., Sp. Pl. 1: 46. 1753; Kükenthal in Das Pflanzenr. IV, 20(Heft 101): 398. 1936.

Type locality: Europe.

Densely tufted slender annual, with fibrous, purplish roots. Culms 10-30 cm. tall, slender. Leaves shorter than to slightly overtopping the culm, narrowly linear, 0.75-1.50 mm. wide, canaliculate, acute at apex; sheath purplish to purple-brown. Corymb simple with 2 or 3 spikes, often reduced to a single spike, 2-4 cm. long; leafy bracts 2 or 3, the longest one up to 17 cm. long; rays up to 3 cm. long; spikes with short rhachis, bearing 2-7 spikelets. Spikelets oblong to lance-oblong, 0.8-3.5 cm. long, 2.00-2.25 mm. wide, strongly flattened, suddenly subacute at apex, densely 15- to 40-flowered, straw-colored; rhachilla 4-angular, not winged. Floral glumes ovate, strongly folded, 1.8-2.0 mm. long, acute at apex, membranous with hyaline margin, stramineous-yellowish, the 3-nerved greenish costa forming a mucro at glume apex. Achenes orbicular-obovate, 0.75 mm. long, thickly biconvex, maturing black, transversely zonate above, minutely lineolate below; style ca. 0.65 mm. long, 2-cleft above for 3/5 its length; stigmas 2.

GENERAL DISTRIBUTION: Widespread in tropical, subtropical and warm-temperate regions of both hemispheres.

DISTRIBUTION IN LESSER ANTILLES: Dominica!

2. ***Pycrus polystachyos*** (Rottb.) P. Beauv., Fl. d'Oware 2: 48, t. 86, f. 2. 1807; C. B. Clarke in Urban, Symb. Antill. 2(1): 17. 1900.

Basionym: *Cyperus polystachyos* Rottb., Descr. Icon. Rar. Nov. Pl. 39, t. 11, f. 1. 1773; Griseb., Fl. Br. W. Ind. Isl. 562. 1864; Duss in Ann. Inst. Col. Marseille 3: 535. 1897.

Type locality: No type cited in original, but it is assumed to be from India.

Syn.: *Cyperus paniculatus* Rottb., Descr. Icon. Rar. Nov. Pl. 40. 1773.

Cyperus scopellatus L. C. Richard in Acta Soc. Hist. Nat. Paris 1: 106. 1792. (Type locality: Cayenne.)

Cyperus subulatus Nees in Flora 11: 335. 1828, nomen nudum.

Cyperus hahnianus Böckl. in Flora 56: 138. 1878. (Type: *Hahn*, Martinique.)

Pycrus polystachyos P. Beauv. var. *hahnianus* (Böckl.) C. B. Clarke in Urban, Symb. Antill. 2(1): 18. 1900.

Annual or short-lived perennial, sometimes with short rhizome. Culms tufted, stiffly erect, (16-)20-50 cm. tall, triquetrous, smooth. Leaves few, shorter than the culms; blades linear, 1.5-3.0 mm. wide, stiffish, flattish-plicate; sheaths reddish-brown. Corymbs often contracted in a subglobose or irregularly lobed headlike cluster of spikelets without rays, 2-5 cm. across, sometimes more or less open with 2-5 short rays up to 5 cm. long; leafy bracts 3-5, usually only the lowest surpassing the inflorescence. Spikelets digitately disposed, linear to linear-lanceolate, 1.0-2.5 cm. long, 1.5-2.0 mm. wide, acute at apex, flattened, 10- to 40-flowered, yellowish- to reddish-brown; rhachilla flexuous. Glumes oblong-ovate to ovate, 1.5-1.8 mm. long, acute at apex, thinly chartaceous, straw-colored or reddish-brown, narrowly

white-membranous on margins, nerveless except for 3-nerved greenish keel. Achenes oblong-obovate, ca. 1 mm. long, lenticular, dark brown at maturity, minutely punctulate; style ca. twice as long as the achene; stigmas 2. Stamen 1.

GENERAL DISTRIBUTION: Tropical and subtropical regions of the world; in eastern Asia the range extends northward into warm-temperate regions as far north as Japan.

DISTRIBUTION IN LESSER ANTILLES: Antigua, Marie Galante!, La Désirade!, Dominica, Martinique, St. Lucia!, St. Vincent!, Grenada, Barbados.

3. *Pycreus pumilus* (L.) Nees [in Linnaea 9: 283. 1834, comb. nud.] ex Urban, Symb. Antill. 2(1): 164. 1900.

Basionym: *Cyperus pumilus* L., Cent. Pl. 2: 6. 1756; Kükenthal in Das Pflanzenr. IV, 20(Heft 101): 375, f. 44A-E. 1936.

Type locality: India.

Syn.: *Cyperus nitens* Retz., Obs. Bot. 5: 13. 1789. (Type: König, "India orientalis.")

Pycreus nitens (Retz.) Nees [in Linnaea 9: 283. 1834, comb. nud.] in Nov. Act. Nat. Cur. 19(Suppl. 1): 53. 1843; C. B. Clarke in Urban, Symb. Antill. 2(1): 16. 1900.

Cyperus leucolepis Carey ex C. B. Clarke in Jour. Linn. Soc. 21: 61. 1884.

Cyperus pumilus L. var. *leucolepis* (Carey ex C. B. Clarke) Kükenthal in Das Pflanzenr. IV, 20(Heft 101): 378. 1936.

Small annual with fibrous roots only. Culms 5-15 cm. tall, rather slender, triquetrous, smooth. Leaves few, shorter than to surpassing the culm; blades narrowly linear, 1.5-2.0 mm. wide, flattish. Corymbs simple with 2-5 rays, frequently contracted to a headlike cluster, the rays 1-2 cm. long, each bearing 10-30 spikelets; leafy bracts 3-5, surpassing the corymb. Spikelets oblong to linear-oblong, 3-15 mm. long, 1.5-2.0 mm. wide, flattened, 8- to 40-flowered, greenish. Glumes subdensely disposed, ovate, 1.2 mm. long, truncate at apex, membranous, 3- or 5-nerved, greenish, the keel forming a mucro at glume apex. Achenes obovate to elliptic-obovate, flattened, 1/3-2/5 as long as the glume, greyish-brown, minutely punctulate; style ca. 0.5 mm. long; stigmas 2. Stamen usually 1.

GENERAL DISTRIBUTION: Tropical Asia, tropical Africa, southeastern United States and the West Indies (south to Trinidad); not in South America and Central America.

DISTRIBUTION IN LESSER ANTILLES: Martinique!

The historical collection, *Duss* 477 from Martinique, is the only documentation of this species in the Lesser Antilles. The American plants are sometimes separated from the typical phase under the name of var. *leucolepis* (which according to Kükenthal comes closer to Indo-African subsp. *membranaceus*). I see no valid point in making such a distinction; both match exactly in their pale, acute-tipped glumes that are closely disposed on the rhachilla. American plants show no similarities to subsp. *membranaceus*, which is characterized by the brownish-tinged, somewhat obtuse

glumes that are more laxly disposed on the rhachilla showing portions of the subtending achenes between the glumes.

MARISCUS Vahl

Mariscus Vahl, Enum. Pl. 2: 372. 1806.

FIGURES 56, 57.

Spikelets with few to many glumes distichously disposed on a continuous simple axis (rhachilla), subterete, subtetragonous, or laterally flattened; rhachilla jointed at base, usually above the prophyll or above the lowest glume, hence spikelets falling entire. Glumes all nearly alike, often only 1 to several (rarely all) bearing flowers. Flowers bisexual with 1-3 stamens and trigynous pistil. Achenes trigonous, linear-oblong or elliptical, one of the sides facing the rhachilla; style not jointed at base, 3-lobed at apex; stigmas 3.

Vegetative characters as in *Cyperus*.

TYPE SPECIES: *Mariscus capillaris* (Sw.) Vahl, based on *Shoenus capillaris* Sw.

About 200 species distributed in temperate, subtropical and tropical regions of the world, with a high species concentration in tropical America.

KEY TO THE SPECIES

1. Floral glumes conspicuously alternate on elongated rhachilla, prominently keeled on back with an acute costa, the margins not or hardly inrolled, hence the glumes not bundled together; spikelets as a rule bearing 3 or more fruits (exception: *M. gracilis* Vahl, in which spikelets are 1- or 2-fruited, but the glumes are strongly folded with an acute keel). 2
- 1a. Floral glumes subfastigate on very short rhachilla, tightly enclosing the subtending achene and upper glume(s) within the inrolled margins, the back obtuse with hardly prominent costa; spikelets as a rule 1- or 2-fruited. . . 12
2. Spikelets more than 3-fruited; glumes without gibbous back, the keel straight. 3
- 2a. Spikelets 1- or 2-fruited; glumes with gibbous back and strongly incurved keel. 7. *M. gracilis*
3. Spikelets more or less flattened; glumes patent, closely disposed, forming 2 conspicuous rows on both sides of straight rhachilla; rhachilla internodes short. 4
- 3a. Spikelets more or less tetragonous, not flattened; glumes erect, distantly disposed, though usually partially overlapping, on elongate and flexuose rhachilla, hence quasi-uniseriably disposed; rhachilla internodes long. 9
4. Floral glumes muticous, sometimes with straightish mucro at apex; plants perennial. 5
- 4a. Floral glumes ending in a long recurved awn; plants annual. 6. *M. squarrosus*
5. Floral glumes straw-colored or yellowish, the costa ending in a patulous cusp ca. 0.3 mm. long; leaves thinly herbaceous, soft. 1. *M. confertus*
- 5a. Floral glumes sanguineous or pale brown and partially stained with red-brown, the costa not noticeably projecting beyond glume apex; leaves stiffly herbaceous to coriaceous. 6
6. Leaves canaliculate-plicate, 1-3 mm. wide; inflorescence a spherical head, up to 2 cm. across; culms up to 30 cm. tall, slender. 2. *M. fuliginus*

- 6a. Leaves flattish, more than 3 (mostly 8-10) mm. wide; inflorescences corymbose with elongate rays, occasionally congested in a lobed head, but more than 2 cm. across. 7
7. Spikelets 4-6 mm. long, very crowded; floral glumes 2.5-2.7 mm. long, tightly disposed; leaves clearly and coarsely septate-nodulose beneath. 3. *M. ligularis*
- 7a. Spikelets 7-20 mm. long, subloosely disposed; floral glumes 2.7-3.0 mm. long, rather distantly disposed; leaves, if septate-nodulose, only faintly and extremely minutely so. 8
8. Spikelets 1.5-1.7 mm. wide; glumes acutely keeled, ca. 1 mm. wide, membranous, lance-ovate, gradually narrowed to acute apex. 4. *M. planifolius*
- 8a. Spikelets 2.5-2.8 mm. wide; glumes obtusely keeled, 1.5-1.8 mm. wide, chartaceous to subcoriaceous, broadly ovate to oval, contracted to mucronate apex. 5. *M. brunneus*
9. Inflorescences congested in a headlike cluster; spikelets 1.5-5.0 mm. long. 11. *M. capillaris*
- 9a. Inflorescences an open corymb with elongate rays; spikelets 6-10 mm. long. 10
10. Spikelets linear, 0.7 mm. wide, very densely disposed (no space remaining between them); achenes linear-oblong. 8. *M. tenuis*
- 10a. Spikelets linear-subulate to subcylindrical, 0.8-1.2 mm. wide, conspicuously spaced; achenes oblong or oblong-elliptic. 11
11. Floral glumes pale glaucous, 3.0-3.7 mm. long; achenes 2 mm. long. 9. *M. meyenianus*
- 11a. Floral glumes yellow-brown, 2.5-3.2 mm. long; achenes 1.5 mm. long. 10. *M. hermaphroditus*
12. Culms tufted without long creeping rhizomes, bearing a cormlike enlargement at base; rachilla not thickened; leaf blades herbaceous, not spiny at apex. 13
- 12a. Culms solitary or few together with long creeping rhizomes, not thickened at base; rachilla corky, thickened, with achenes sunken into it; leaf blades coriaceous, spiny at apex. 16. *M. pedunculatus*
13. Spikes 4-5 mm. wide; spikelets 1.8-2.5 mm. long. 12. *M. alternifolius*
- 13a. Spikes more than 5 mm. wide; spikelets more than 2.5 mm. long. 14
14. Spikelets at most 0.7 mm. wide; glumes pale green, herbaceous, faintly or hardly veined; bracteoles subtending spikelets scalelike, mucous. 13. *M. sumatrensis*
- 14a. Spikelets 1.0-1.5 mm. wide; glumes straw-colored or stained with brown, membranous, prominently 3- to 5-veined; some or all bracteoles subtending spikelets, long-awned. 15
15. Achenes 2.00-2.25 mm. long; spikelets obtuse at apex; corymbs always open, with rays 5-20 cm. long; spikes cylindrical, truncate at apex. 14. *M. mutisii*
- 15a. Achenes 1.5-1.7 mm. long; spikelets acute at apex; corymbs often more or less congested, without elongated rays, rarely open with rays up to 4 cm. long; spikes oblong with rounded apex. 15. *M. cayennensis*

1. *Mariscus confertus* (Swartz) C. B. Clarke in Urban, Symb. Antill. 2(1): 50. 1900.

Basionym: *Cyperus confertus* Swartz, Prodr. 20. 1788; Griseb., Fl. Br. W. Ind. Isl. 563. 1864, pro parte; Kükenthal in Das Pflanzenr. IV, 20(Heft 101): 497. 1936, incl. var. *bidentatus* (Vahl) Kükenthal.

Type: *Swartz in Hb. Willd. no. 1349*, Jamaica (B).

Syn.: *Cyperus bidentatus* Vahl, Enum. Pl. 2: 330. 1806. (Type: Senegal(?), *Dupuis.*)

Plants perennial, variable in size. Culms tufted or solitary, (2-)6-35 cm. tall, (0.25-)1.00-2.00 mm. thick, trigonous, smooth, leaved at base, the base later forming a small cormlike enlargement. Leaves few to a culm, all basal or rarely up to $\frac{1}{2}$ the height of the culm; blades linear, 1-5 mm. wide, 3-30 cm. long, thinly herbaceous, soft, gradually acuminate at apex; sheaths tinged with brownish-purple, the ventral side hyaline, the basal sheaths bladeless, dark brown-purple. Inflorescence umbelliform, simple, congested in a head in poorly developed individuals; involucre bracts 2-4, elongate, leaflike, 2-3 times as long as the inflorescence; rays 2-5, patent, 1-8 cm. long, slender; prophylls ca. 5 mm. long, straw-colored, purplish-tinged, the orifice shallowly 2-toothed. Spikes globose-ovoid, densely bearing 8-20 spikelets on an abbreviated axis, 10-15 mm. long and as broad, straw-colored or light stramineous-brown. Spikelets divergent, jointed at base, lance-oblong, 6-10 mm. long, 2.0-2.2 mm. wide, compressed, straw-colored, 6- to 18-flowered. Rhachilla only very narrowly winged or with extremely acute edges. Glumes ovate, 2.2-2.5 mm. long, thickly membranous or thinly herbaceous, straw-colored or light yellow-brown, 3- or 4-nerved on both sides, gradually narrowed from above the base toward a more or less 3-dentate apex, the costa broad, green, projected beyond the apex of glumes into a straightish awn 0.3 mm. long. Achenes obovate, 3-sided, 1.0-1.2 mm. long, blackish, punctulate, tapering at base, contracted above to mucronulate apex; stigmas 3.

GENERAL DISTRIBUTION: West Indies, Venezuela, Colombia and Galapagos Islands.

DISTRIBUTION IN LESSER ANTILLES: St. Barts!, Martinique.

2. ***Mariscus fuligineus*** (Chapman) C. B. Clarke in Urban, Symb. Antill. 5: 290. 1904.

Basionym: *Cyperus fuligineus* Chapman, Fl. South. U.S. 511. 1872; Kükenthal in Das Pflanzenr. IV. 20(Heft 101): 470. 1936.

Type: *Chapman s.n.*, Key West, Florida, U.S.A. (NY!).

Assumed perennial. Culms tufted without conspicuous rhizome, 10-30 cm. tall, slender but stiff, smooth, thickened at base. Leaves few, shorter than the culms 1-3 mm. wide, plicate, stiffish, rather suddenly acute at apex, sheaths up to 5 cm. long, the lower ones bladeless or nearly so, deeply reddish-purple or purple-brown. Corymb headlike, with 6-30 radiate spikelets, spherical, 1-2 cm. across; leafy bracts 2 or 3, usually the lower 2 elongated, up to 12 cm. long. Spikelets linear-lanceolate, acute, 5-10 mm. long, 1.5-2.0 mm. wide, weakly flattened, 6- to 16-flowered, straw-colored and stained with red-brown; rhachilla narrowly winged. Glumes subloosely disposed, ovate to broadly ovate, subacute at mucronulate apex, 1.8-2.0 mm. long, chartaceous, straw-colored and tinged with red brown especially toward margins, slenderly 3- or 4-nerved on both sides of broad costa;

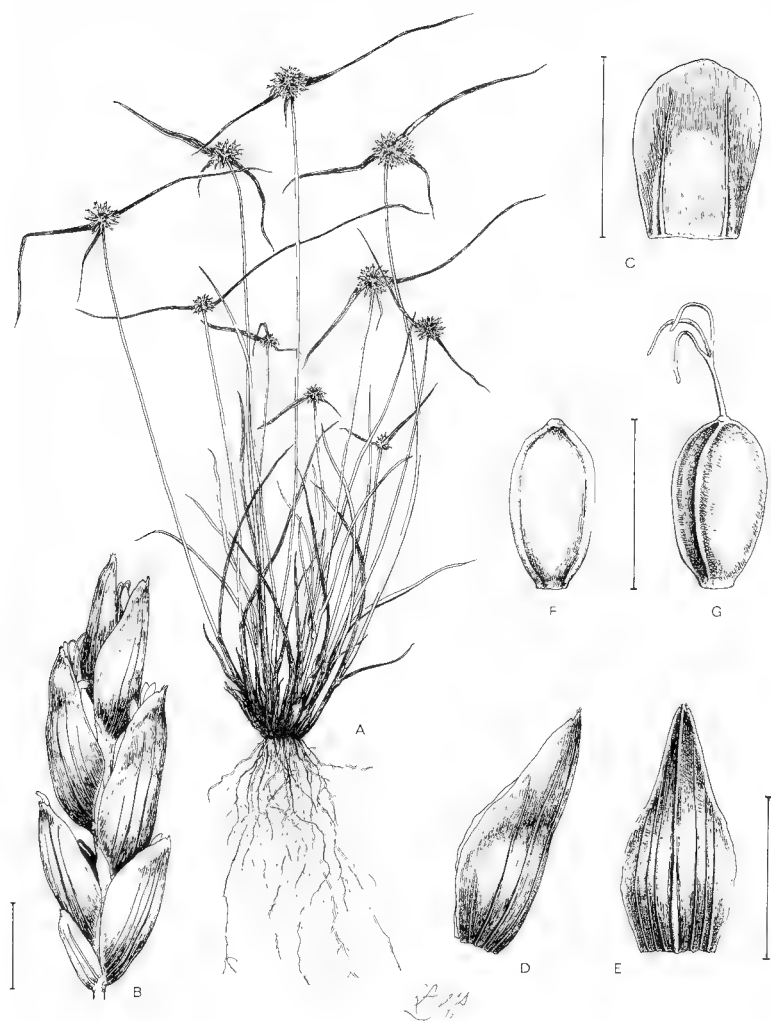


FIGURE 56. Cyperaceae. a-g, *Mariscus fuliginus*: a, habit; b, spikelet; c, prophyll at base of spikelet; d, e, lateral and dorsal views of floral glume; f, ventral view of achene; g, achene with style. Bar scales (for floral parts) = 1 mm.

obscurely 3-nerved, straw-colored, forming a scabrous mucro at glume apex. Achenes elliptic-ovate to elliptic, triquetrous with slightly concave sides, 1.0-1.2 mm. long, maturing blackish; style nearly 1 mm. long, 3-cleft above for $\frac{1}{2}$ its length.

GENERAL DISTRIBUTION: Confined to the Florida Keys and the West Indies.

DISTRIBUTION IN LESSER ANTILLES: Anguilla!

This species has been documented in the Lesser Antilles by a single collection from Island Harbour, Anguilla, *Proctor 18608* (A).

3. *Mariscus ligularis* (L.) Urban, Symb. Antill. 2(1): 165. 1900.

Basionym: *Cyperus ligularis* L., Fl. Jam. Pugill. 3. 1759; Griseb., Fl. Br. W. Ind. Isl. 566. 1864; Kükenthal in Das Pflanzenr. IV, 20(Heft 101): 475. 1936.

Type locality: Jamaica.

Syn.: *Mariscus rufus* H. B. K., Nov. Gen. Sp. 1: 216, f. 67. 1815; C. B. Clarke in Urban, Symb. Antill. 2(1): 48. 1900. (Type locality: Mexico.)

Robust perennial with very short rhizome. Culm solitary, 30-80 cm. tall, 3.5-5.0 mm. thick, obtusely trigonous, smooth, minutely papillose. Leaves many, densely tufted at culm base; blades broadly linear, 8-12 mm. wide, equaling or surpassing the culm, 1-costate, flattish, subcoriaceous, glaucous-green, septate-nodulose, serrulate-scabrous on margins, the apex gradually long acuminate, strongly scabrous on margins and midvein; sheaths reddish- or purplish-brown, eventually loosely disintegrated into fibers. Inflorescence a dense compound umbellike corymb, 8-13 cm. long and as broad; involucre bracts 5-8, leaflike, patent, much longer than the inflorescence, the longest one 4-5 times as long as the inflorescence; rays 7-12, patent, the longer ones relatively equal in length, 2-10 cm. long; prophylls tubular, purplish-brown, truncate at orifice. Spikes nearly sessile or short-peduncled, congested, the central one oblong-cylindrical, 1.5-2.5 cm. long, 1.0-1.2 cm. in diameter, the lateral one subglobose, up to 1.5 mm. long, divaricate. Spikelets divaricate, lance-oblong, weakly compressed, 4-6 mm. long, 2.0-2.7 mm. wide, 2- to 6-flowered; rhachilla broadly winged. Glumes oval or ovate-oval, 2.5-2.7 mm. long, slightly incurved, membranous, pale brown and occasionally tinged with red-brown, blunt at apex, 9-nerved, obtuse on keel. Achene obovate, 3-sided, 1.5 mm. long, brown, minutely papillose; style 3-cleft.

GENERAL DISTRIBUTION: Tropical America, from southern United States and Mexico south to southern Brazil, tropical West Africa and the Mascarene Islands.

DISTRIBUTION IN LESSER ANTILLES: St. Thomas, Antigua, Montserrat!, Guadeloupe, Dominica, St. Lucia!, St. Vincent!, Mustique, Grenada!, Barbados.

4. *Mariscus planifolius* (L. C. Richard) Urban, Symb. Antill. 2(1): 165. 1900.

Basionym: *Cyperus planifolius* L. C. Richard in Acta Soc. Hist. Nat. Paris 1: 106. 1792; Kükenthal in Das Pflanzenr. IV, 20(Heft 101): 447, f. 49D-G. 1936.

Type: von Rohr, French Guiana, Cayenne.

Syn.: *Cyperus purpurascens* Vahl, Enum. Pl. 2: 359. 1806. (Type: West, St. Croix.)
Mariscus purpurascens (Vahl) C. B. Clarke in Urban, Symb. Antill. 2(1): 51. 1900.

Cyperus brunneus sensu Griseb., Fl. Br. W. Ind. Isl. 565. 1864, pro parte, non Swartz.

Robust perennial, tufted with short rhizome. Culms 60-90 cm. tall, 3-4 mm. thick below, triquetrous, smooth or rarely scabrid below inflorescence. Leaves many, conspicuously surpassing the culm, linear, 8-10 mm. wide, flattish, stiffish, glaucous-green, faintly transversely septate beneath, finely reddish-brown lineolate mostly on upper surface; sheaths red- or purple-brown, the ventral side membranous. Corymb open, compound, 10-20 cm. long and as wide; leafy bracts 5-8, much surpassing the corymb; rays 9-14, rather slender, very unequal, patent, bearing somewhat corymbose clusters of spikes; raylets absent or up to 2 cm. long; bracteole setaceous, very short; spikes broadly ovoid, 1.5-3.0 cm. long and as broad, densely bearing many spikelets. Spikelets spreading or the lower ones weakly reflexed, linear, 6-16 mm. long, 1.5-1.7 mm. wide, gradually tapering to acute tip, light brown and red-tinged, 8- to 14-flowered; rhachilla broadly winged. Glumes suberect, subloosely disposed, folded with acute keel, lance-ovate, 2.7-3.0 mm. long, 1 mm. wide, gradually narrowed to acute apex, membranous with hyaline margins, pale brownish and weakly red-tinged, slenderly 3(sometimes 4)-nerved on both sides, the keel slender, green, somewhat 3-nerved. Achenes obovate or narrowly so, trigonous with shallowly concave sides, 1.2-1.5 mm. long, maturing black; style 2 mm. long, 3-cleft above for $\frac{1}{2}$ its length.

GENERAL DISTRIBUTION: Endemic to the West Indies.

DISTRIBUTION IN LESSER ANTILLES: St. Barts!, Antigua, Saba, Guadeloupe!, Dominica, Martinique!, St. Lucia!, St. Vincent, Grenada.

5. *Mariscus brunneus* (Swartz) C. B. Clarke in Urban, Symb. Antill. 2(1): 51. 1900.

Basionym: *Cyperus brunneus* Swartz, Fl. Ind. Occ. 1: 116. 1797; Griseb., Fl. Br. W. Ind. Isl. 565. 1864, pro parte.

Type locality: "India occidentali."

Syn.: *Cyperus brizaeus* Vahl, Enum. Pl. 2: 316. 1806. (Type locality: Puerto Rico and Cayenne.)

Cyperus ottonis Böckl. in Linnaea 36: 350. 1870.

Cyperus evaginatedus Böckl. in Linnaea 36: 351. 1870.

Cyperus discolor Böckl., Cyp. Nov. 1: 7. 1888. (Type: O. Kuntze, St. Thomas.)

Cyperus krugii Böckl., Cyp. Nov. 1: 8. 1888. (Type: Sintenis, Puerto Rico.)

Mariscus brizaeus (Vahl) C. B. Clarke in Urban, Symb. Antill. 2(1): 52. 1900.

Cyperus planifolius L. C. Rich. var. *brunneus* (Sw.) Kükenthal in Fedde Rep. Sp. Nov. 23: 189. 1926, in Das Pflanzenr. IV, 20(Heft 101): 448. 1936.

Perennial, densely tufted with short rhizome. Culms 20–80 cm. tall, 1.5–3.0 mm. thick below, triquetrous, smooth. Leaves many, shorter than to nearly equaling the culms, narrowly linear, 3–8 mm. wide, flattish-plicate, stiffish, whitish-green and finely reddish-brown-lineolate on upper surface, not septate beneath; sheaths red-brown. Corymb open with elongated rays or congested in one headlike, lobed cluster, 2–8 cm. long and as wide, subdense, simple to partially compound; leafy bracts 3–5, patent, the lower ones usually up to 3 times as long as the open corymb, or up to 5 times as long as the headlike corymb; rays (when developed) patent, 1–7 cm. long, subrigid, bearing 1–4 spikes; spikes broadly ovoid, up to 3 cm. long, 2.5 cm. wide. Spikelets divergent, linear-oblong or lance-oblong, 10–20 mm. long, (2.0–)2.5–2.8 mm. wide, subcompressed, rather suddenly obtuse or subacute at apex, 6- to 17-flowered, generally sanguineous-brown or sanguineous, at times olive-brown; rhachilla thickish, broadly winged. Glumes patent, subdensely disposed, boat-shaped with obtuse keel, broadly ovate to oval, 2.7–3.0 mm. long, 1.5–1.8 mm. wide, contracted to mucronate apex, chartaceous to thinly coriaceous, sanguineous or straw-colored and stained with red-brown, 3- to 5-veined on both sides, the margin slightly white-hyaline, the relatively broad costa glaucous-green, 3-nerved. Achenes widely elliptic, trigonous with somewhat convex sides, 1.2–1.5 mm. long, ca. 0.8 mm. wide; style 2.0–2.5 mm. long, 3-cleft above for $\frac{1}{2}$ its length.

GENERAL DISTRIBUTION: Southern United States (Florida), the West Indies and Central America (southern Mexico).

DISTRIBUTION IN LESSER ANTILLES: Anguilla!, St. Barts!, Sabal, La Desirade!, Guadeloupe, Martinique, St. Vincent, Barbados!, Grenada.

Kükenthal (1926, 1936), believing *Mariscus brunneus* to be not specifically distinct from *M. planifolius*, treated it as a variety of the latter. From my observation, I have determined that these two differ in the details of floral parts, though they are very similar in habit. In *M. brunneus*, the broadly ovate glumes are chartaceous with an obtusely keeled back, and are rather densely disposed on oblong spikelets 2.5–2.8 mm. wide; in *M. planifolius*, the lance-ovate glumes are membranous with broadly hyaline margins, are folded with an acute keel, and are loosely disposed on linear flexuous spikelets which are 1.5–1.7 mm. wide. So far as I have examined specimens, the glumes of *M. brunneus* are generally deeply colored with red-brown, while in *M. planifolius* they are straw-colored. The broadly elliptic achenes of *M. brunneus* are clearly separable from the narrowly obovate ones in *M. planifolius*. The distinction thus drawn between the two is always valid except for the color of floral glumes, suggesting that these two are good species. However, I disagree with C. B. Clarke, who separated *M. brizaeus* with open corymbs from *M. brunneus* with contracted heads. These two are nothing but two extreme conditions of inflorescences and in no sense constitute taxonomic difference.

6. *Mariscus squarrosus* (L.) C. B. Clarke in Hook. f., Fl. Brit. India **6**: 623. 1893, with regard to basionym.

Basionym: *Cyperus squarrosus* L., Cent. Pl. **2**: 6. 1756.

Type: König, India orientalis.

Syn.: *Cyperus aristatus* Rottb., Descr. Icon. Rar. Nov. Pl. Ill. **23**, t. 6, f. 1. 1773; Kükenthal in Das Pflanzenr. IV, **20**(Heft 101): 502, f. 55 F-J. 1936. (Type: König, India orientalis.)

Small annual, more or less tufted with fibrous roots. Culms (2-)5-20 cm. tall, slender, smooth, few-leaved at base. Leaves generally $\frac{1}{2}$ - $\frac{3}{4}$ as long as the culms, narrowly linear, 1-2 mm. wide, soft, smooth; basal sheaths purplish-brown, up to 15 mm. long, the outer ones only short-bladed. Inflorescence umbelliform with 1-3(-5) rays, or congested in a head; involucre bracts 2-3(-5), leaflike, patent, the longer ones up to 7 cm. long and 2 mm. wide, much exceeding the inflorescence; rays, when developed, slender, patent, 1-4 cm. long; prophylls 2-3 mm. long, tubular, red-brown, obliquely truncate at bimucronate orifice. Spikes ovoid or broadly so, 6-15 mm. long and as wide, densely bearing (3-)7-16 spikelets. Spikelets spreading, jointed at base, linear-oblong or broadly linear, 4-15 mm. long, 1.0-1.5 mm. wide, compressed, 8- to 30-flowered. Glumes ovate or ovate-elliptic, 1.5 mm. long, thickly membranous, reddish-brown or straw-colored, 7-nerved including the keel, gradually narrowed to a strongly recurved acute apex, the keel projected beyond the glume apex into a recurved awn 0.4-0.5 mm. in length. Achenes narrowly obovate, 3-sided, 0.6-0.7 mm. long, blackish-brown at maturity, minutely punctulate, abruptly contracted at apiculate apex; style 3-fid.

GENERAL DISTRIBUTION: Pantropic; rare in American tropics.

DISTRIBUTION IN LESSER ANTILLES: Anguilla!

Although this species has long been referred to as *Cyperus aristatus*, in the Linnaean Herbarium the specimen marked as "*squarrosus*" in Linnaeus' hand represents this taxon, while the second sheet with a single inflorescence is *Cyperus maderaspatanus* Willd. Consequently, *Mariscus squarrosus* is the correct name of what has generally been passing as *C. aristatus*.

7. *Mariscus gracilis* Vahl, Enum. Pl. **2**: 373. 1806; C. B. Clarke in Urban, Symb. Antill. **2**(1): 43. 1900.

Type: Richard, "America meridionali."

Syn.: *Kyllinga filiformis* Swartz, Prodr. **20**. 1788; Fl. Ind. Occ. **1**: 212. 1797; Griseb., Fl. Br. W. Ind. Isl. **568**. 1864. (Type locality: Jamaica.)

Mariscus filiformis (Swartz) Spreng., Syst. Veg. **1**: 234. 1825, non Römer & Schultes, 1817.

Mariscus swartzii Dietr., Sp. Pl. **2**: 343. 1833; C. B. Clarke in Urban, Symb. Antill. **2**(1): 42. 1900.

Kyllinga granularis Böckl. in Linnaea **35**: 432. 1868.

Cyperus swartzii (Dietr.) Böckl. ex Kükenthal in Fedde Rep. Sp. Nov. **23**: 186. 1926; Das Pflanzenr. IV, **20**(Heft 101): 533. 1936.

Cyperus swartzii (Dietr.) Böckl. ex Kükenthal var. *granularis* (Böckl.)
Kükenthal in Fedde Rep. Sp. Nov. 23: 186. 1926.

Rhizome short. Culms densely to subloosely tufted, 5-45(-60) cm. tall, slender, triquetrous, smooth, hardly thickened at base. Leaves narrowly linear to filiform, 0.3-4.0(-6.0) mm. wide, herbaceous, much shorter than the culms; sheaths purple-brown or reddish-purple. Inflorescences simple, varying from an open corymb with few short rays to a headlike cluster of 2-5 sessile spikes to a single globose sessile spike, 0.8-3.0 cm. long, 0.6-1.0 cm. wide; bracts 2-4, patent to spreading, the longest up to 12 cm. long; rays (when developed) up to 15 mm. long; spikes ellipsoidal to subglobose, 6-9 mm. long, 3-4 mm. wide, rounded at apex, light straw-brown, densely bearing several to many spikelets. Spikelets spreading or the lower ones somewhat reflexed, somewhat obovate, 1.5-2.0 mm. long, acute at apex, keeled, bearing 2 or 3 glumes, 1(or rarely 2)-fruited, light straw-brown; rachilla broadly winged. Glumes ovate, acute, 1.5 mm. long, folded with an acute keel, chartaceous, light brown or light reddish-brown, distinctly 5- to 7-nerved on both sides, the costa slender, greenish-brown, 1-nerved. Achenes obovate, acute at both ends, ca. 1 mm. long, acutely triquetrous, maturing blackish; style short, 3-cleft.

GENERAL DISTRIBUTION: Found only in the West Indies and southern Mexico.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe!

Mariscus swartzii and *M. gracilis* are here regarded as identical. Actually, *M. gracilis* is nothing but a very slender phase of *M. swartzii*, and both make a good match in their characteristic spikelets. As expressed in the above description, this species is very variable in the dimensions of leaves and culms as well as in the form of inflorescences. After examining a number of specimens from the total range of this taxon, I fail to recognize any of the varieties proposed by Kükenthal (1936).

8. *Mariscus tenuis* (Swartz) C. B. Clarke in Urban, Symb. Antill. 2(1): 48. 1900, only with regard to basionym.

Basionym: *Cyperus tenuis* Swartz, Prodr. 20. 1788; Fl. Ind. Occ. 1: 119. 1797; Kükenthal in Das Pflanzenr. IV, 20(Heft 101): 416. 1936.

Type: Swartz, Jamaica.

Syn.: *Mariscus flabelliformis* H. B. K., Nov. Gen. Sp. 1: 215. 1815; C. B. Clarke in Urban, Symb. Antill. 2(1): 50. 1900. (Type locality: Venezuela, Caracas.)

Cyperus platystachyus Griseb., Fl. Br. W. Ind. Isl. 567. 1864. (Type locality: Jamaica.)

Cyperus hartii Böckl., Cyp. Nov. 1: 9. 1888; Duss in Ann. Inst. Col. Marseille 3: 539. 1897. (Type: Hart, Jamaica.)

Cyperus dussii Böckl., Cyp. Nov. 2: 37. 1890, excl. type; Duss in Ann. Inst. Col. Marseille 3: 541. 1897, as "*dussianus*."

Herb, tufted with short rhizome. Culms 15-30 cm. tall, 1.0-1.7 mm. thick below, slender but stiff, triquetrous, smooth, not noticeably thickened at

base. Leaves basal and subbasal, somewhat spaced, narrowly linear, shorter than to longer than the culm, 2-3 mm. wide, herbaceous, flat, soft; sheaths 2-8 cm. long, the upper ones pale-stramineous, the basal 2 or 3 deeply stained with red- or purple-brown. Corymb simple, open but subdense, 2.0-3.5 cm. tall, 3-7 cm. wide; leafy bracts 5-9, spreading, most of them surpassing the corymb, the longest up to 16 cm. long; rays 5-9, patent to spreading, slender, up to 2 cm. long, terminated by a spike; spikes ovoid-cylindrical, rounded-truncate at apex, 1.0-1.5 cm. wide, 1-2 cm. long, densely bearing many spikelets. Spikelets spreading or the lower ones weakly reflexed, linear, 7-10 mm. long, ca. 0.7 mm. wide, subtetragonous, acute at apex, greyish- or stramineous-green, bearing 5-8 glumes, 4- to 7-fruited; rhachilla slender, flexuous, winged. Glumes distant but overlapping, suberect, narrowly elliptic or ovate-oblong, subobtuse or mucronate at apex, 2.5-2.7 mm. long, membranous, pale-stramineous, 3- or 4-nerved on both sides of costa, the broad hyaline margins involute, the costa green, 3-nerved, subacute. Achenes linear-oblong, weakly curved, 1.5-1.7 mm. long, triquetrous, red-brown; style 1.5 mm. long, filiform, 3-cleft above for $\frac{1}{2}$ its length.

GENERAL DISTRIBUTION: Tropical West Africa and tropical America from southern Mexico and the West Indies southward to southern Brazil.

DISTRIBUTION IN LESSER ANTILLES: Martinique, Dominica!

9. *Mariscus meyenianus* (Kunth) Nees in Martius, Fl. Brasil. 2(1): 49. 1842; C. B. Clarke in Urban, Symb. Antill. 2(1): 47. 1900.

Basionym: *Cyperus meyenianus* Kunth, Enum. Pl. 2: 88. 1837; Griseb., Fl. Br. W. Ind. Isl. 567. 1864; Kükenthal in Das Pflanzenr. IV, 20(Heft 101): 490. 1936.

Type locality: Brazil.

Syn.: *Cyperus trispicatus* Böckl. in Flora 65: 14. 1882; Duss in Ann. Inst. Col. Marseille 3: 541. 1897. (Type locality: Martinique.)

Perennial. Culms tufted, 20-50 cm. tall, 1-3 mm. thick below, triquetrous, smooth, thickened at base. Leaves rather many, linear, equaling to slightly overtopping the culm, 3-8 mm. wide, flat, soft, herbaceous; sheaths red- or purple-brown. Corymbs open, simple or compound, 5-10 cm. long, 6-18 cm. wide; leafy bracts 5-10, the longer ones 3-4 times as long as the corymb; rays 4-12, spreading-patent, unequal, up to 10 cm. long, slender, stiffish, terminated by a single spike or a secondary corymb with up to 5 short raylets; spikes oblong-cylindrical to oblong, 1.5-3.0 cm. long, 1-2 cm. wide, densely bearing many spikelets. Spikelets patent to spreading, or the lower ones slightly reflexed, linear-subulate, 6-10 mm. long, 0.8-1.0 mm. wide, tetragonous, gradually narrowed to acute apex, glaucous, bearing 4-6 glumes, 3- or 4-flowered; rhachilla winged. Glumes suberect and appressed, rather remote but overlapping, oblong-elliptic, 3.0-3.7 mm. long, obtuse, herbaceous, pale or weakly glaucous-stramineous, prominently ca. 4-nerved on both sides, rather broadly white-hyaline on margins; costa

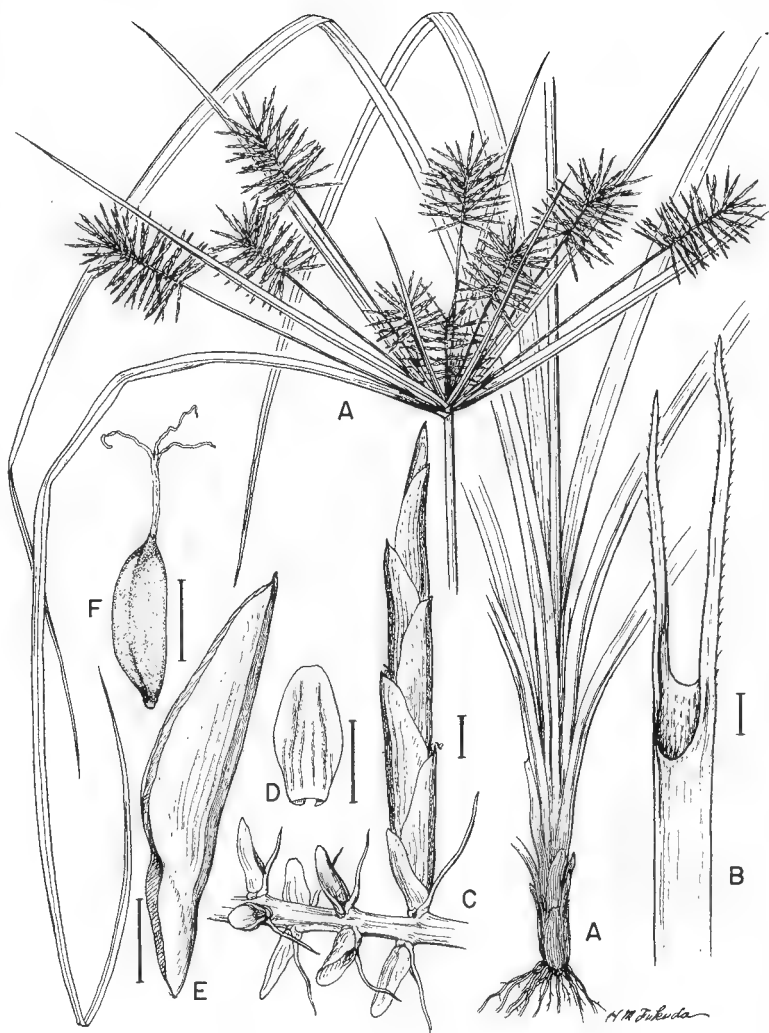


FIGURE 57. Cyperaceae. a-f, *Mariscus meyenianus*: a, habit; b, upper part of prophyll at base of anthela ray; c, portion of rachis bearing a spikelet; d, prophyll at base of spikelet; e, glume; f, achene with style. Bar scales (for floral parts) = 1 mm.

glaucous-green, 3-nerved, ending below glume apex or forming a mucro. Achenes tightly surrounded by the subtending glume, oblong and weakly curved, 2 mm. long, trigonous with shallowly concave sides, rounded to apex, maturing brown; 2.0-2.5 mm. long, 3-cleft above for $\frac{2}{3}$ its length.

GENERAL DISTRIBUTION: Brazil and adjoining Paraguay, Uruguay and northern Argentina, adjunct to Martinique.

DISTRIBUTION IN LESSER ANTILLES: Martinique.

This essentially Brazilian species was only once recorded from Martinique (Duss 219, 455). It differs from closely allied *M. hermaphroditus* in the glaucous spikelets, prominently veined glumes, and larger, oblong achenes.

10. *Mariscus hermaphroditus* (Jacq.) Urban, Symb. Antill. 2(1): 165. 1900.

Basionym: *Carex hermaphrodita* Jacq., Collect. 4: 174. 1790.

Type locality: Venezuela, Caracas.

Syn.: *Mariscus jacquinii* H. B. K., Nov. Gen. Sp. 1: 216. 1815; C. B. Clarke in Urban, Symb. Antill. 2(1): 45. 1900.

Mariscus jacquinii H. B. K. var. *angustior* C. B. Clarke in Urban, Symb. Antill. 2(1): 46. 1900.

Cyperus hermaphroditus (Jacq.) Standley in Contr. U. S. Natl. Herb. 18: 88. 1916; Kükenthal in Das Pflanzenr. IV, 20(Heft 101): 487, f. 54A-D. 1936.

Cyperus hermaphroditus Standl. var. *angustior* (C. B. Clarke) Kükenthal in Das Pflanzenr. IV, 20(Heft 101): 489. 1936.

Perennial with short rhizome. Culms solitary or few together, 20-60 cm. tall, 1-3 mm. thick below, rigid, triquetrous, smooth. Leaves several to a culm, shorter than the culm, 2-8 mm. wide, soft, herbaceous, flat; sheaths cinnamon-colored or slightly purplish-tinged. Corymb open, simple or occasionally in part compound, 3-14 cm. long, 5-10 cm. wide; leafy bracts 3-8, patent, the lower 2-4 surpassing the corymb, the longest up to 4 times as long as the corymb; rays 3-12, patent, very unequal, the longest up to 10 cm. long, slender, each bearing 1 spike, or rarely 2 or 3 spikes; spikes cylindrical, 1-4 cm. long, 1.0-1.5 cm. across, obtuse at apex, rather uniformly subdensely bearing many spikelets. Spikelets spreading or the lower ones eventually slightly reflexed, linear or linear-lanceolate, gradually acute at apex, 6-9 mm. long, 1.0-1.2 mm. wide, subterete or inconspicuously tetragonous, bearing 4-8 glumes, 3- to 7-flowered, straw-brown; rhachilla winged. Glumes suberect, distant but overlapping, oval, obtuse, 2.5-3.2 mm. long, involute, membranous, yellow-brown, slenderly ca. 3-nerved on both sides, narrowly white-hyaline on margins; costa green, 3-nerved, ending just below the glume apex or forming a mucro. Achenes oblong-elliptic to obovate-oblong, 1.5 mm. long, trigonous with shallowly concave sides, maturing light brownish; style 2.5 mm. long, 3-cleft above for $\frac{2}{3}$ its length. Stamens 3.

GENERAL DISTRIBUTION: Subtropical and tropical America, from southern United States southward to northern Argentina.

DISTRIBUTION IN LESSER ANTILLES: Martinique, St. Lucia!, St. Vincent, Grenada.

Variety *angustior* is based on a depauperate specimen, and cannot be separated as a taxon.

11. *Mariscus capillaris* (Swartz) Vahl, Enum. Pl. 2: 372. 1806; C. B. Clarke in Urban, Symb. Antill. 2(1): 48. 1900.

Basionym: *Schoenus capillaris* Swartz, Prodr. 20. 1788.

Type locality: Jamaica.

Syn.: *Cyperus nanus* Willd., Sp. Pl. 1: 272. 1798; Kükenthal in Das Pflanzenr. IV, 20(Heft 101): 535. 1936.

Cyperus tenuis Swartz var. *capillaris* (Swartz) Kükenthal in Fedde Rep. Sp. Nov. 23: 188. 1926.

Cyperus tenuis sensu Griseb., Fl. Br. W. Ind. Isl. 563. 1864, non Swartz.

Mariscus tenuis C. B. Clarke in Urban, Symb. Antill. 2(1): 28. 1900, excl. basionym.

Cyperus nanus Willd. var. *subtenuis* Kükenthal in Das Pflanzenr. IV, 20(Heft 101): 536. 1936.

Slender perennial, densely tufted with short, knotty rhizome. Culms 5-30 cm. tall, capillary to slenderly trigonous, 0.10-0.75 mm. thick, smooth or rarely scabrid below inflorescence, hardly thickened at base. Leaves shorter than culm, up to 15 cm. long, setaceous to narrowly linear, up to 1 mm. wide; sheaths red- or purple-brown. Inflorescence congested, head-like, usually bearing only 1 spike, subglobose, 5-10 mm. long and as broad; bracts setaceous, 2 or 3, patent to reflexed, the lower 1 or 2 much surpassing the head, up to 12 cm. long. Spikelets few to 25, upper ones erect to patent, lower ones divergent to reflexed, linear to linear-lanceolate, subacute, 1.5-5.0 mm. long, hardly 1 mm. wide, flattened-tetraquetrous, bearing 2-9 glumes, 1- to 7-fruited, greenish-stramineous or tinged with light red-brown; rachilla flexuose, broadly winged. Glumes suberect, remote but overlapping, ovate or ovate-oval, 1.2-1.7 mm. long, obtuse, muticous or with straight or weakly recurved cusp, herbaceous, pale to straw-colored or tinged with light red-brown, up to 4-veined on both sides, the keel green. Achenes elliptic, trigonous, hardly 1 mm. long, maturing black-brown; style 0.7 mm. long, 3-cleft above for $\frac{3}{4}$ its length.

GENERAL DISTRIBUTION: Found only in the West Indies and Mexico.

DISTRIBUTION IN LESSER ANTILLES: Anguilla, St. Martin, St. Barts!, Guadeloupe!.

Plants from the Lesser Antilles are sometimes separated from the typical phase as var. *subtenuis*, which is characterized by broader leaves (up to 1 mm. in width), taller culms (reaching 30 cm. in height), and inflorescences with many spikelets. Having examined a number of specimens, I fail to

recognize var. *subtenuis* as a taxon. In this species, both leaves and culms vary from being capillary and short to ca. 1 mm. in width. The size of inflorescences and the number of glumes forming a spikelet also vary continuously, and often spikelets borne on smaller heads have more flowers than those on larger heads. The typical phase of *M. capillaris*, bearing capillary leaves and small heads with a few spikelets, represents an extremely depauperate condition in this variation range. The application of the name *Cyperus tenuis* Swartz by Grisebach and Clarke to the stouter phase of this species is erroneous. True *Cyperus tenuis*, with an open inflorescence and subterete spikelets, belongs to a completely different group.

12. *Mariscus alternifolius* Vahl, Enum. Pl. 2: 376. 1806.

Type: *Thonning*, Guinea.

Syn.: *Kyllinga umbellata* Rottb., Descr. Icon. Rar. Nov. Pl. 15, t. 4, f. 2. 1773, nom. illeg.

Mariscus umbellatus (Rottb.) Vahl, Enum. Pl. 2: 376. 1806, with regard to basionym, nom. illeg.; C. B. Clarke in Urban, Symb. Antill. 2(1): 41. 1900.

Cyperus umbellatus (Rottb.) C. B. Clarke in Jour. Linn. Soc. 20: 296. 1883, pro parte, nom. illeg.; Duss in Ann. Inst. Col. Marseille 3: 536. 1897, non Burm. f., 1768, nec Roxb., 1820.

Cyperus subumbellatus Kükenthal in Das Pflanzenr. IV, 20(Heft 101): 523. 1936.

Herbs subloosely tufted with short rhizome. Culms 20–55 cm. tall, 1–2 mm. thick below, slender but stiff, triquetrous, smooth, thickened at base. Leaves several to a culm, slender, linear, 1.5–5.0 mm. wide, shorter than the culm, herbaceous, soft, flat; sheaths 2–8 cm. long, reddish-purple. Corymbs open and loose, simple, 2–6 cm. long, 3–10 cm. wide; leafy bracts 6–12, patent, the longer ones up to 4 times as long as the corymb; rays 5–15, 1–8 cm. long, slender, patent, terminated by a single spike; spikes oblong or oblong-cylindrical, 8–12 mm. long, 4–5 mm. across, rounded at both ends, very densely bearing many spikelets. Spikelets spreading and the lower ones eventually slightly reflexed, oblong-elliptic, 1.8–2.5 mm. long, 0.5–0.6 mm. wide, obtusely trigonous, subobtuse, 1- or 2-flowered, brownish-green; rachilla winged. Glumes elliptic, 1.8–2.0 mm. long, mucronulate at the somewhat obtuse apex, thinly membranous, pale and red-brown or with brown striae or flecks, 4-nerved on both sides of costa, the margins broadly white-hyaline involute, the costa brownish-green. Achenes oblanceolate-elliptic, trigonous, 1.2–1.3 mm. long, maturing red-brown; style ca. 0.5 mm. long, deeply 3-cleft.

GENERAL DISTRIBUTION: West and Central Africa, Madagascar, the Mascarene Islands, and the West Indies.

DISTRIBUTION IN LESSER ANTILLES: Martinique!

The occurrence of this species on Martinique is undoubtedly of introduced origin from tropical Africa. In the Lesser Antilles, it has been collected

only in the neighborhood of St. Pierre (*Duss 4513, Kimber 590*); additional reports of *M. alternifolius* have been from Cuba and Trinidad.

Unfortunately, the binomial *M. umbellatus* cannot be used, because its basionym, *Kyllinga umbellata* Rottboell, is illegitimate (Rottboell cited *Scirpus cyperoides* L., an earlier validly published name, in the synonymy of *Kyllinga umbellata* at the time of publication). The name *Mariscus alternifolius* has no connection with *Cyperus alternifolius*.

13. *Mariscus sumatrensis* (Retz.) J. Raynal in *Adansonia* 15: 110. 1975;
T. Koyama in *Gard. Bull. [Singapore]* 30: 152. 1977.

Basionym: *Kyllinga sumatrensis* Retz., *Obs. Bot.* 4: 13. 1786.

Type locality: Sumatra.

Syn.: *Scirpus cyperoides* L., *Mant. Pl.* 181. 1771. (Type locality: "India orientali.")

Mariscus sieberianus Nees [in *Linnaea* 9: 286. 1835, nomen nudum] ex C. B.

Clarke, *Fl. Brit. India* 6: 662. 1893; Urban, *Symb. Antill.* 2(1): 40. 1900.

Cyperus cyperoides (L.) O. Kuntze, *Rev. Gen. Pl.* 3(2): 333. 1898; Kükenthal
in *Das Pflanzenr.* IV, 20(Heft 101): 514. 1936.

Mariscus cyperoides (L.) Urban, *Symb. Antill.* 2(1): 164. 1900, non Dietrich,
1833.

Perennial with short woody rhizome clothed with brown fibers. Culms solitary or few together, erect, triquetrous, 10–50 cm. tall, smooth, the more or less thickened base leafy. Leaves rather many, shorter than to equaling the culm; blades linear, 3–6 mm. wide, flattish-plicate, herbaceous; sheaths pale, eventually becoming brownish or reddish-brown. Corymbs simple, open, 3–8 cm. wide; rays 3–12, patent, the longer ones up to 8 cm. long, terminated by a spike; spikes cylindrical, 1.0–2.5 cm. long, 6–10 mm. wide, densely bearing many spikelets, greenish; leafy bracts 3–8, the lower ones surpassing the corymb. Spikelets spreading or the lower ones more or less reflexed, linear-lanceolate, 3–5 mm. long, 0.7 mm. wide, bearing 4 or 5 glumes, 1- or 2-fruited; rhachilla jointed above the base, with white-hyaline lanceolate wings. Glumes lance-oblong, obtuse or mucronulate at apex, 3 mm. long, inrolled-margined, herbaceous, pale green, faintly several-nerved, the keel 3-nerved, forming an obtuse back. Achenes linear-oblong, ca. $\frac{2}{3}$ as long as the glume, straw-colored, minutely punctulate; style longer than the achene; stigmas 3. Stamens 3.

GENERAL DISTRIBUTION: Tropical Africa, tropical and subtropical Asia; introduced into the West Indies.

DISTRIBUTION IN LESSER ANTILLES: Grenada!

A collection of Broadway (*s. n.*, dated 1896 (NY!)) is the only record of this species in the Lesser Antilles. An adventive from the Old World, it has also been found in Trinidad and Jamaica.

14. *Mariscus mutisii* H. B. K., *Nov. Gen. Sp.* 1: 216, *t.* 66. 1815; C. B.
Clarke in Urban, *Symb. Antill.* 2(1): 46. 1900.

Type locality: Nova Granata, Mexico.

Syn.: *Cyperus mutisii* (H. B. K.) Griseb., Fl. Br. W. Ind. Isl. 567. 1864; Kükenthal in Das Pflanzenr. IV, 20(Heft 101): 484. 1936.

Cyperus martinicensis Böckl., Cyp. Nov. 2: 38. 1890. (Type: *Duss 471*, Martinique.)

Cyperus mutisii (H. B. K.) Griseb. var. *martinicensis* (Böckl.) Kükenthal in Das Pflanzenr. IV, 20(Heft 101): 483. 1936.

Perennial with short rhizome. Culms 50–100 cm. tall, triquetrous, 2–6 mm. thick below, more or less enlarged at base. Leaves shorter than to nearly equaling the culm, linear, 4–10 mm. wide, herbaceous, soft, gradually acute at apex; sheaths purplish-brown or brown. Corymbs open, simple or in part compound, 6–25 cm. long, 5–20 cm. wide; leafy bracts 3–8, the lower 2–4 much surpassing the corymb; rays slender, 5–20 cm. long, patent, terminated by a single spike or somewhat pyramidal cluster of 2–7 spikes; spikes cylindrical, 2–4 cm. long, 5–8 mm. wide, obtuse, greenish-brown, when compound the lateral spikes up to 1.5 cm. long, spreading to slightly reflexed, sessile or rarely with very short raylet. Spikelets densely disposed, divergent to slightly reflexed, elliptic, obtuse, 3–4 mm. long, subterete, 1.00–1.25 mm. wide, bearing 3–5 glumes, 1- or 2(rarely 3)-fruited. Glumes ovate-elliptic, obtuse, the flower-bearing ones 2.8–3.0 mm. long, membranous, 3- to 5-veined on both sides, straw-colored to light brown, the green keel obscurely 3-nerved, ending just below glume apex or forming a mucro. Achenes elliptic, 2.00–2.25 mm. long, triquetrous with shallowly concave sides, red-brown at maturity; style 1.0–1.5 mm. long, 3-cleft above for ½ (or more) of its length.

GENERAL DISTRIBUTION: Tropical America, from Mexico to southern Brazil.

DISTRIBUTION IN LESSER ANTILLES: Martinique, Grenada.

15. *Mariscus cayennensis* (Lam.) Urban, Symb. Antill. 2(1): 165. 1900.

Basionym: *Kyllinga cayennensis* Lam., Illus. des genres 1: 149. 1791.

Type: *von Rohr*, French Guiana, Cayenne.

Syn.: *Mariscus flavus* Vahl, Enum. Pl. 2: 374. 1806; C. B. Clarke in Urban, Symb. Antill. 2(1): 41. 1900. (Syntypes: *von Rohr*, *Richard*, "America meridionalis.")

Cyperus flavomariscus Griseb., Fl. Br. W. Ind. Isl. 567. 1864; Duss in Ann. Inst. Col. Marseille 3: 542. 1897. (Type localities: Jamaica, Antigua.)

Cyperus flavus (Vahl) Nees in Linnaea 19: 698. 1847; Kükenthal in Das Pflanzenr. IV, 20(Heft 101): 531. 1936, non Presl, 1828.

Mariscus flavus Vahl var. *humilis* C. B. Clarke in Dur. & Schinz, Fl. Trop. Afr. 5: 588. 1895; Urban, Symb. Antill. 2(1): 42. 1900.

Cyperus cayennensis (Lam.) Britton in Bull. Dept. Agr. Jamaica 5(Suppl. 1): 8. 1907.

Rhizome decumbent, knotty, clothed with dusky brown fibers; roots rigid. Culms loosely tufted, rigid, 15–70 cm. tall, 1–4 mm. thick, triquetrous, smooth, with a cormlike enlargement at base. Leaves 3–5 to a culm, linear, shorter than the culm, 3–6 mm. wide, plicate-flattish, herbaceous, gradually

narrowed to acute apex; sheaths purple- or light red-brown, the lowest 1 or 2 subaphyllous, eventually disintegrating into dark brown fibers. Corymb simple, open, with up to 8 rays or contracted to a radiate cluster of spikes 3-10 (rarely to 20) cm. wide, 2-4 cm. high; leafy bracts 4-8, spreading, the lower 3-6 surpassing the corymb; rays, when elongated up to 4 (rarely to 8 cm.) long, rather stout, most often terminated by 1 (occasionally to 3, and very rarely to 7) spikes; spikes cylindrical to oblong-cylindrical, 1-3 cm. long, 4-10 mm. thick, green and slightly colored with straw-brown when fruiting. Spikelets patent to divergent, each subtended by a setaceous and scabrous bracteole shorter than to slightly longer than the spikelet; the spikelets oblong-elliptic to elliptic, 2.5-4.0 mm. long, 1.0-1.5 mm. wide, subterete, acute-tipped, bearing 3-5 glumes, 1- or 2-fruited; rhachilla winged. Glumes ovate or ovate-elliptic, 2.5-3.0 mm. long, subobtuse, membranous, light straw-colored to yellowish, slenderly 3- or 4-veined on both sides, the costa green, 3-nerved. Achenes obovate to elliptic-obovate, 1.5-1.7 mm. long, obtuse, maturing brown; style ca. 2 mm. long, 3-cleft above for $\frac{1}{2}$ its length.

GENERAL DISTRIBUTION: Widely distributed in North and South America, from eastern and southern United States south to Argentina.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe, Martinique!, St. Vincent.

16. *Mariscus pedunculatus* (R. Br.) T. Koyama in Gard. Bull. [Singapore] 30: 157. 1977.

Basionym: *Remirea pedunculata* R. Br., Prodr. Fl. Nov. Holl. 1: 236. 1810.

Type locality: Australia.

Syn.: *Remirea maritima* Aublet, Hist. Pl. Guian. Franc. 1: 45, t. 16. 1775; C. B. Clarke in Urban, Symb. Antill. 2(1): 136. 1900; non *Mariscus maritimus* Miquel, 1860, nec *M. maritimus* C. B. Clarke, 1896. (Type localities: French Guiana, Cayenne.)

Cyperus pedunculatus (R. Br.) Kern in Acta Bot. Neerl. 7: 798. 1958.

Rhizome slender but rigid, horizontally long-creeping, branching, the internodes 1-10 cm. long, 1-3 mm. thick, clothed with brown sheaths and their fibrous remnants. Culms solitary or few together at nodes of rhizome, 3-15 cm. tall, usually with a considerable length of lower part in sand, 1-2 mm. thick, trigonous, smooth. Leaves aggregated on the lower part of the upper ground portion of culms; blades linear, recurved, shorter than or occasionally equaling the culm, 4-5 mm. wide below, coriaceous, glaucous-green; sheaths light brown. Corymbs congested in a headlike cluster at the apex of the culm, with 3-8 spikes, 2-3 cm. across; leafy bracts mostly 3-6, patent or reflexed, equaling or longer than the corymb, the longest up to 8 cm. long. Spikes ellipsoid to ovoid, 1-2 cm. long, 7-10 mm. wide, densely bearing many spikelets, glaucous- or yellowish-green. Spikelets ovoid, 4-5 mm. long, acute, bearing 4 glumes, 1-fruited; rhachilla jointed above the base. Glumes ovate to broadly ovate, acute, obtuse on back, several-veined, the lower 3 empty, 3 mm. long, the fourth 3.5-4.5 mm. long, bearing a

bisexual flower. Achene oblong, trigonous, 2.5 mm. long, maturing greyish-brown; style shorter than the achene; stigmas 3. Stamens 3.

GENERAL DISTRIBUTION: Tropical America, tropical Asia, and northern Australia.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe!.

This species, generally growing in pure communities on coastal sand dunes, is characteristic in its thick leaves and the one-flowered spikelets with a spongy-thickened rhachilla. Although this species has long been placed in the tribe Rhynchosporeae under the name *Remirea maritima*, because of its typical cyperoid morphology and its continuous rhachilla jointed only at the base, it properly belongs to *Mariscus*. This species is newly added to the flora of the Lesser Antilles, being documented by a neglected collection from Guadeloupe, *Bena s. n.*, dated 1944-46 (GH!, P!).

KYLLINGA Rottboell

Kyllinga Rottboell, Descr. Icon. Rar. Nov. Pl. 12. 1773. FIGURE 58.

Spikelets bilaterally flattened with several glumes and 1-5 (1 or 2 in Taiwan species) flowers, falling entire; rhachilla short, disarticulating above the prophyll; glumes 2-ranked, folded, membranous to hyaline, the lowest two smaller than the remainder, empty, the succeeding glume(s) larger and flower-bearing, the distal glume(s) empty or bearing staminate flower, the base of glumes decurrent to the rhachilla; the keel prominent, sometimes winged. Flowers bisexual and staminate; hypogynous bristles absent; stamens 2 or 3; pistil digynous; achene bilaterally flattened with one angle facing the rhachilla, the style not jointed at base, 2-fid at apex; stigmas 2.

Perennials; the rhizome short or horizontally creeping, sometimes knotty. Leaves basal, the blades elongated or reduced. Inflorescence headlike with 1-few sessile spikes; spikes cylindrical, ellipsoidal or globose, bearing many spikelets crowded on a short rhachis.

TYPE SPECIES: *Kyllinga brevifolia* Rottboell.

About 40 species in temperate, subtropical and tropical regions of both hemispheres.

KEY TO THE SPECIES

1. Rhizome 3-6 mm. thick, knotty, decumbent, lignescent; culms arranged in a row along the rhizome; leaves reduced to subaphyllous sheaths, the blades, when developed, much shorter than the sheath. 2
- 1a. Annual without rhizome, or rhizome short, occasionally emitting slender stolons; culms not as above; leaves long-bladed. 3
2. Leafy bracts 5-8, up to 20 cm. long; upper sheaths short-bladed. 1. *K. polyphylla*
- 2a. Bracts 2 or 3, up to 5 mm. long, shorter than the head; sheaths bladeless. ... 2. *K. peruviana*

3. Rhizome emitting slender stolons. 3. *K. brevifolia*
- 3a. Plants tufted, without stolons. 4
4. Perennial with short, more or less bulbous rhizome; central spike of inflorescences short-cylindrical. 4. *K. odorata*
- 4a. Annual with fibrous roots only; spikes globose or ovoidal. 5
5. Floral glumes not winged on keel; spikelets 1.5-2.0 mm. long. ... 5. *K. pumila*
- 5a. Floral glumes winged on keel; spikelets 2.7-4.0 mm. long. ... 6. *K. squamulata*

1. *Kyllinga polyphylla* Willd. ex Kunth, Enum. Pl. 2: 134. 1837.

Type localities: Mauritius, Guinea & Congo.

Rhizome ligneous, knotty, horizontally creeping, 4-6 mm. thick, clothed with purple-brown scales: Culms approximate and arranged in a row along the rhizome, 30-50 cm. tall, 1.5-2.5 mm. thick below, triquetrous, smooth, slightly thickened at base. Leaves 3 or 4 to a culm, spaced, short-bladed or reduced to subaphyllous sheaths, the uppermost one up to 18 cm. long, bearing a blade up to 10 cm. long by 5 mm. wide, lower sheaths stained with purple-brown, the basal 1 or 2 cataphylloid. Heads bearing 3-1 spikes, ovoidal, 8-12 mm. long; leafy bracts 5-8, patent to reflexed, up to 20 cm. long. Spikes ca. 6 mm. long, pale green. Spikelets oblong-elliptic to ovate-elliptic, 3.0-3.5 mm. long, ca. 1 mm. wide, 1- or 2-flowered. Glumes lance-ovate, acute, membranous, pale and tinged with stramineous-yellow, strongly folded with spinulose green keel projecting beyond glume apex forming an erect mucro ca. 0.5 mm. long; lower glumes 3- or 4-nerved, bearing a bisexual flower; upper glume 2- or 3-nerved, empty or bearing a staminate flower. Achenes ovate-oblong, ca. 1.3 mm. long, laterally lenticular, rounded to a mucronate apex, maturing dark brown; style 2.5 mm. long, deeply 2-cleft.

GENERAL DISTRIBUTION: Tropical Africa and Madagascar; introduced to Ceylon, Malesia, the Fiji Islands, and the West Indies.

DISTRIBUTION IN LESSER ANTILLES: Martinique!

This new adventive is represented by a single collection from Martinique, *Proctor 21767* (A!), collected at Morne Rouge in 1960. It is apparently a recent introduction.

2. *Kyllinga peruviana* Lam., Encycl. Méth. Bot. 3: 366. 1789; C. B. Clarke in Urban, Symb. Antill. 2(1): 12. 1900.

Type locality: Peru.

Syn.: *Maricus aphyllus* Vahl, Enum. Pl. 2: 373. 1806. (Type locality: Peru and Senegal.)

Kyllinga aphylla (Vahl) Kunth, Enum. Pl. 2: 127. 1837; Griseb., Fl. Br. W. Ind. Isl. 568. 1864.

Cyperus peruvianus (Lam.) Williams in Bull. Herb. Boiss. 2^e sér. 7: 1907; Kükenthal in Das Pflanzenr. IV, 20(Heft 101): 586, f. 62E-J. 1936.

Rhizome knotty, horizontally decumbent, 3-5 mm. thick, ligneous, clothed with cinnamon-colored or pale-brown scales. Culms arranged in a

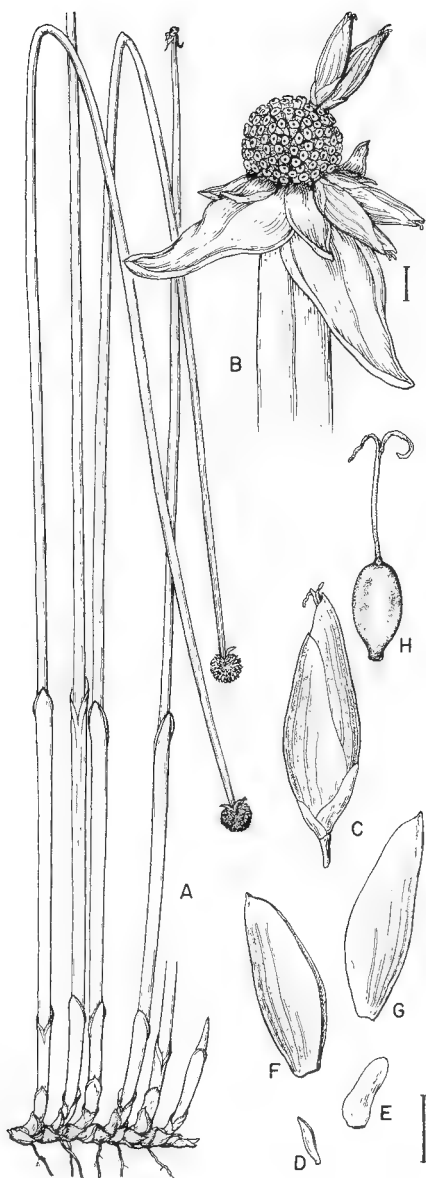


FIGURE 58. Cyperaceae. a-h, *Kyllinga peruviana*: a, habit; b, head showing the rachis; c, spikelet; d-g, glumes; h, achene with style. Bar scales (for floral parts) = 1 mm.

row along the rhizome, rather close, 15-60 cm. tall, 1.5-2.0 mm. thick below, obscurely tetraginous below, somewhat trigonous toward apex, smooth, glaucous-green, more or less thickened at base, clothed at base with 4 or 5 bladeless sheaths only. Upper 2 sheaths dorsally glaucous-green, ventrally cinnamon-colored, obliquely truncate at orifice, bladeless or occasionally the uppermost one developing a short subulate blade; uppermost sheath up to 15 cm. long, the second half the length of the uppermost; basal sheaths cataphyllous, pale brown and variegated or lineolate with sanguineous-brown. Inflorescence a single terminal spike, globose, 6-9 mm. across; bracts 2 or 3, lance-ovate, 2-5 mm. long, reflexed, pungent-tipped, scabrous on margins. Spikelets many, lanceolate or narrowly elliptic, 2.8-3.5 mm. long, 0.8-1.0 mm. wide, 1-flowered. Glumes ovate to lance-ovate, the lower 2.5-3.0 mm. long, the upper as long as the spikelet, straw-brown, slightly shiny, 3- or 4-nerved, mucronate at apex, the green keel smooth. Achenes narrowly obovate, 2.2-2.5 mm. long, rounded to a mucronate apex, bilaterally flattened, maturing brown; style ca. 2.5 mm. long; stigmas 2.

GENERAL DISTRIBUTION: West Africa, the West Indies, the Americas from Costa Rica southeast to Colombia, and Trinidad and Tobago.

DISTRIBUTION IN LESSER ANTILLES: Antigua, Grenada!.

3. *Kyllinga brevifolia* Rottb., Descr. Icon. Rar. Nov. Pl. 13, t. 4, f. 3. 1773; Griseb., Fl. Br. W. Ind. Isl. 568. 1864; C. B. Clarke in Urban, Symb. Antill. 2(1): 11. 1900.

Type: König, India.

Syn.: *Kyllinga monocephala* Thunb., Fl. Japon. 35. 1784; Griseb., Fl. Br. W. Ind. Isl. 568. 1864, non Rottb., 1773.

Cyperus brevifolius (Rottb.) Hassk., Cat. Hort. Bogor. 24. 1884; Kükenthal in Das Pflanzenr. IV, 20(Heft 101): 600. 1936.

Perennial with long creeping slender rhizomes. Culms remotely or closely arranged in a single row along the rhizome, 7-30 cm. tall, soft, slender, few-leaved at base. Leaves radical and subradical; blades shorter than or occasionally equaling the culms, narrowly linear, 2-3 mm. wide, soft, herbaceous, scabrid on margins and on the abaxial midvein; sheaths membranous, brownish or purplish-brown, the lower ones almost bladeless. Inflorescence a terminal single globose head (rarely consisting of 2 or 3 heads); involucre bracts 3, leaflike, very unequal in length; head globose or broadly ovoid-globose, 5-10 mm. long and as wide, pale green and often becoming straw-colored at maturity, densely bearing numerous spikelets. Spikelets lance-oblong, compressed, 3.0-3.5 mm. long, jointed at base, 4- or 5-squamosely, 1-flowered. Glumes ovate-elliptical, folded with an acute keel, membranous, pale green, sometimes with resinous spots, 7-nerved including a midvein, cuspidate at apex, the keel sparsely spinulose toward the apex, projecting beyond the apex of the glume into a straight or slightly recurved short cusp. Achene 1.5 mm. long, obovate, laterally lenticular, brownish, punctulate; style 2-cleft.

GENERAL DISTRIBUTION: Tropical, subtropical and warm-temperate regions of the world, with many forms.

DISTRIBUTION IN LESSER ANTILLES: Antigua, Guadeloupe, Dominica!, Martinique, St. Lucia!, St. Vincent!, Grenada!.

4. *Kyllinga odorata* Vahl, Enum. Pl. 2: 382. 1806; C. B. Clarke in Urban, Symb. Antill. 2(1): 13. 1900; Duss in Ann. Inst. Col. Marseille 3: 543. 1897, pro parte.

Type: *von Rohr*, "America meridionali."

Syn.: *Kyllinga sesquiflora* Torrey in Ann. Lyc. N. Y. 3: 287. 1836.

Cyperus sesquiflorus (Torrey) Mattf. & Kükenthal ex Kükenthal in Das Pflanzenr. IV, 20(Heft 101): 591, f. 6E-J. 1936.

Perennial, tufted with short rhizome clothed with brown fibers, not stoloniferous. Culms slender, erect, 10-32 cm. tall, triquetrous, smooth. Leaves few to a culm, shorter than the culm; blades narrowly linear, 2-4 mm. wide, subrigid, flattish-plicate; sheaths pale brownish. Inflorescence a head with 1-3 spikes, 1.0-1.2 cm. long, ca. 1 cm. wide, whitish-green; central spike cylindrical, 6-12 mm. long, 5-6 mm. wide; lateral spikes elliptical, much shorter than the central spike, each densely bearing many spikelets; leafy bracts 3-5, reflexed, the lowest up to 10 cm. long. Spikelets patent, ovate to ovate-oval, flattened, 1.9-2.1 mm. long, 0.8-1.2 mm. wide, 1- or 2-flowered, 1-fruited; glumes broadly ovate, membranous, folded with green keel, apiculate at apex, the lower two ca. 2 mm. long, 9- or 11-nerved, the upper two 2.5 mm. long, 5- or 7-nerved. Achenes elliptic-obovate or obovate-oval, laterally flattened, maturing dark brown; stigmas 2. Stamens 2.

GENERAL DISTRIBUTION: West and South Africa, Madagascar, southeastern United States, Central America, the West Indies, South America, northern Australia.

DISTRIBUTION IN LESSER ANTILLES: Antigua, Guadeloupe, Dominica!, Martinique!, St. Vincent, Grenada.

5. *Kyllinga pumila* Michaux, Fl. Bor.-Amer. 1: 28. 1803; C. B. Clarke in Urban, Symb. Antill. 2(1): 13. 1900.

Type locality: North America.

Syn.: *Cyperus densicaespitosus* Mattf. & Kükenthal ex Kükenthal in Das Pflanzenr. IV, 20(Heft 101): 597. 1936.

Kyllinga odorata sensu Duss in Ann. Inst. Col. Marseille 3: 543. 1897, pro parte, non H. B. K., 1816.

Annual, densely tufted with fibrous roots. Culms usually 4-30 cm. tall, slender, smooth, not enlarged at base. Leaves few to a culm, narrowly linear, generally shorter than culm, 1.5-3.0 mm. wide, thinly herbaceous, soft, gradually long-acute at apex; sheaths stained with red-brown, the lower ones often subaphyllous. Inflorescence a head with 1-3 sessile spikes, pale green, ovoid; leafy bracts 3 or 4, spreading, up to 4 cm. long; central

spike ovate or ovate-elliptic, obtuse, 4-7 mm. long, ca. 5 mm. across; lateral ones broadly elliptic, smaller. Spikelets densely disposed, lance-elliptic, acute, 1.5-2.0 mm. long, flattened, bearing 3 or 4 glumes, 1(or rarely 2)-flowered; glumes lance-oblong, thinly membranous, pale to slightly straw-colored, the keel green, laxly spinulose-scabrid, ending in a mucro, the flower-bearing glume 3-nerved, ca. 2 mm. long. Achenes broadly oblong-elliptic, 1.0-1.2 mm. long, laterally flattened, maturing yellow-brown; style ca. 1 mm. long, 2-cleft above for $\frac{1}{3}$ its length.

GENERAL DISTRIBUTION: Tropical Africa and subtropical and tropical America from southern United States south to northern Argentina.

DISTRIBUTION IN LESSER ANTILLES: Antigua, Dominica!, Martinique, St. Lucia!, St. Vincent!, Barbados, Grenada!.

One of the commonest species of American *Kyllinga*, this species is easily recognized by the densely tufted culms terminated by a head of 1 to 3 spikes.

6. *Kyllinga squamulata* Thonn. ex Vahl, Enum. Pl. 2: 381. 1806; Duss in Ann. Inst. Col. Marseille 3: 543. 1897; C. B. Clarke in Urban, Symb. Antill. 2(1): 11. 1900.

Type: *Thonning*, Guinea.

Syn.: *Kyllinga metzii* Hochst. ex Steud., Syn. Pl. Glum. 2: 70. 1855. (Type: *Hohenacker* 199, "India orientali.")

Cyperus metzii (Hochst. ex Steud.) Mattf. & Kükenthal ex Kükenthal in Das Pflanzenr. IV, 20(Heft 101): 612, f. 64J,K. 1936.

Tufted annual with fibrous roots only. Culms 5-30 cm. tall, slender, smooth, rather soft. Leaves shorter than to equaling the culms, 1.5-2.0 mm. wide, herbaceous, soft, gradually narrowed to acute apex; sheaths stained with purple-brown, the basal 1 or 2 sheaths subaphyllous. Inflorescence as a rule a single terminal spike, rarely a 3-spiked head, globose, 6-10 mm. in diameter. Spikelets ovate, 2.7-4.0 mm. long, 2-3 mm. wide including wings, pedicelled, 1-flowered. Glumes lance-ovate, the upper and the lower nearly equal, membranous, pale straw-colored with scattered brown resinous spots, 2-veined on both sides, acute, the costa broadly winged to $\frac{2}{3}$ from base and ending in a short mucro, the wing lobed-cristate, ca. 1 mm. wide. Achenes orbicular-ovate, 2.0-2.5 mm. long, laterally flattened, maturing brown; style ca. 1.5 mm. long, 2-cleft above for $\frac{2}{5}$ its length.

GENERAL DISTRIBUTION: Tropical Africa, Madagascar, India, and Indo-China; introduced into Martinique.

DISTRIBUTION IN LESSER ANTILLES: Martinique!.

This weedy species in the Old World tropics must have been introduced to Martinique with some crops from Africa; its occurrence there had already been noted by Duss' collections from at least two localities of the island.

TORULINIUM Desvaux

Torulinium Desvaux in Hamilton, Prodr. 15. 1825.

Spikelets with several to many 2-ranked glumes; rachilla articulated between flowers and breaking into segments containing one achene (as a rule) with wings which eventually become more or less corky and clasp the achene. Achenes 3-sided; stigmas 3.

Vegetative characters as in *Cyperus*.

TYPE SPECIES: *Torulinium ferax* (L. C. Richard) Urban, based on *Cyperus ferax* L. C. Richard, and now correctly known as *Torulinium odoratum* (L.) Hooper.

About 10 species in the tropics, with a high species concentration in tropical America.

KEY TO THE SPECIES

- 1. Leaves 4-12 mm. wide; culms 2-5 mm. thick. 2
- 1a. Leaves 0.5-1.5 mm. wide; culms 0.3-0.5 mm. thick. 3. *T. filiforme*
- 2. Floral glumes yellowish. 2. *T. odoratum*
- 2a. Floral glumes red- to purple-brown. 1. *T. flexuosum*

1. *Torulinium flexuosum* (Vahl) T. Koyama in Phytologia 29: 74. 1974.

Basionym: *Cyperus flexuosus* Vahl, Enum. Pl. 2: 359. 1806; Kükenthal in Das Pflanzenr. IV, 20(Heft 101): 620. f. 65A-E. 1936.

Type: von Rohr, "America meridionalis."

Syn.: *Dididium vahlü* Schrader ex Nees in Mart., Fl. Brasil. 2(1): 53. 1842.

Cyperus insignis Kunth, Enum. Pl. 2: 92. 1837.

Cyperus vahlü (Schrader ex Nees) Steud., Syn. Pl. Glum. 2: 48. 1855; Griseb., Fl. Br. W. Ind. Isl. 566. 1864.

Torulinium vahlü (Schrader ex Nees) C. B. Clarke in Urban, Symb. Antill. 2(1): 56. 1900.

Cyperus flexuosus Vahl var. *insignis* (Kunth) Kükenthal in Das Pflanzenr. IV, 20(Heft 101): 622. 1936.

Rhizome short, lignescent. Culms (10-)20-75 cm. tall, 2-5 mm. thick below, triquetrous, smooth. Leaves broadly linear, mostly shorter than but occasionally surpassing the culm, 6-12 mm. wide, flattish, herbaceous, soft; sheaths up to 20 cm. long, the upper ones pale brownish to pale, the lower 1-3 reddish- or purple-brown. Corymbs open, compound, 6-12 cm. long and as wide; leafy bracts 5-7, the lower ones up to twice as long as the corymb; rays 4-9, unequal, patent, rigid, up to 8 cm. long, each terminated by a 3- to 10-spicate, dense secondary corymb 2-4 cm. across, the raylets very short, up to 2.5 cm. long, the bracteoles shorter than to slightly longer than the secondary corymb. Spikes broadly ovoid or somewhat cylindrical, 1-3 cm. long, 2-3 cm. wide, densely bearing many spikelets. Spikelets spreading, linear, terete, 6-20 mm. long, ca. 1 mm. wide, 4- to 11-flowered, weakly flexuous; rachilla flexuose, the internodes ca. 0.75 mm. wide, spongy-thickened with broad wings, clasping the achene. Glumes erect, distant but partially overlapping, ovate, 2.5-3.0 mm. long, involute, thickly membra-

nous with hyaline margins, red- or purplish-brown, slenderly 1- or 2-veined on both sides, rounded to subacute at apex, the costa green, finely several-veined, ending at the obtuse apex of glume or forming a mucro at subacute apex. Achenes obovate-oblong, trigonous, 1.5 mm. long, maturing dark brown; style ca. 2 mm. long, 3-cleft above for $\frac{1}{2}$ its length. Stamens 3.

GENERAL DISTRIBUTION: Mexico, the West Indies, Brazil.

DISTRIBUTION IN LESSER ANTILLES: Antigua, Montserrat!, Guadeloupe!.

2. *Torulinium odoratum* (L.) Hooper in Kew Bull. 26: 579. 1972.

Basionym: *Cyperus odoratus* L., Sp. Pl. 1: 46. 1753; Griseb., Fl. Br. W. Ind. Isl. 565. 1864; Duss in Ann. Inst. Col. Marseille 3: 540. 1897.

Type locality: "Habitat in America ad fluviorum ripas."

Syn.: *Cyperus ferax* L. C. Richard in Acta Soc. Hist. Nat. Paris 1: 106. 1792; Duss in Ann. Inst. Col. Marseille 3: 541. 1897; Kükenthal in Das Pflanzenr. IV, 20(Heft 101): 615. 1936.

Torulinium confertum Hamilton, Prodr. 15. 1825; C. B. Clarke in Urban, Symb. Antill. 2(1): 53. 1900.

Diclicium aciculare Schrad. ex Nees in Mart., Fl. Brasil. 2(1): 55. 1842.

Cyperus acicularis (Schrad. ex Nees) Steud., Syn. Pl. Glum. 2: 45. 1855.

Torulinium ferax (L. C. Rich.) Urban, Symb. Antill. 2(1): 165. 1900.

Cyperus ferax L. C. Rich. var. *acicularis* (Schrad. ex Nees) Kükenthal in Das Pflanzenr. IV, 20(Heft 101): 619. 1936.

Cyperus flexuosus sensu Griseb., Fl. Br. W. Ind. Isl. 566. 1864, pro parte, non Vahl.

Annual or assumedly (under certain conditions) short-lived perennial. Culms solitary or few together, erect, 30-100 cm. tall, triquetrous, smooth, with a bulbous enlargement at base. Leaves several, shorter than the culm; blades linear, 4-10 mm. wide, flattish, herbaceous; sheaths rather long, brownish or purplish-brown. Corymbs ample, compound to decompound, loose to subdense, 5-30 cm. wide; rays 5-12, patent, the longer ones up to 20 cm. long; raylets absent or several to each secondary corymb, up to 3 cm. long; spikes oblong-cylindrical, 2-3 cm. long, ca. 1.5 cm. wide, bearing 20-40 spikelets; leafy bracts 6-8, patent, the lower ones surpassing the corymb, the lowest up to 50 cm. long. Spikelets spreading to reflexed, linear, subterete, 10-25 mm. long, 1.0-1.5 mm. wide, 10- to 25-flowered, yellow-green and yellowish-brown at maturity; rhachilla flexuous, winged, the wings elliptic, first hyaline, eventually becoming more or less corky and tightly clasping the achene. Glumes ovate-elliptic, obtuse, 2.0-3.5 mm. long, yellowish and red-brown-striate, the greenish, obtuse costa 7- to 9-nerved. Achenes oblong to oblong-obovate, 3-sided, $\frac{2}{3}$ as long as the glume, dehiscing tightly enveloped with the rhachilla wings, the rhachilla internode, and the next higher glume; style shorter than the achene; stigmas 3. Stamens 3.

GENERAL DISTRIBUTION: Pantropic.

DISTRIBUTION IN LESSER ANTILLES: Montserrat!, Nevis!, Guadeloupe!, Dominica, Martinique, St. Lucia!, St. Vincent!, Grenada!, Barbados.

3. *Torulinium filiforme* (Swartz) C. B. Clarke in Urban, Symb. Antill. 2(1): 57. 1900.

Basionym: *Cyperus filiformis* Swartz, Prodr. 20. 1788; Fl. Ind. Occ. 1: 120. 1797; Griseb., Fl. Br. W. Ind. Isl. 565. 1864; Kükenthal in Das Pflanzenr. IV, 20(Heft 101): 624, f. 65F-J. 1936.

Type locality: Jamaica.

Densely tufted with short, divided rhizome. Culms 8-30 cm. tall, 0.3-0.5 mm. thick, smooth, hardly thickened at base. Leaves 1-3 to a culm, $\frac{1}{2}$ - $\frac{3}{4}$ as long as the culm, filiform, 0.5-1.5 mm. wide, plicate; sheaths brown or purplish-brown. Inflorescence a pseudolateral corymb with 1-3 filiform rays up to 4 cm. long or reduced to 2-6 subfastigate spikelets; leafy bracts 1-3, the lowest erect and continued down to the culm, usually surpassing the corymb; remaining bracts setaceous; spikes with very short rhachis bearing 2-7 subfastigate spikelets. Spikelets linear-subulate, 6-17 mm. long, nearly 1 mm. thick, subterete, gradually narrowed to an acuminate apex, weakly flexuose, 4- to 10-flowered, greenish-straw-colored; rhachilla flexuose, oblanceolate at base of glumes. Glumes laxly alternate, ovate-elliptic, 2.5-3.0 mm. long, subobtusate and often mucronate at apex, dorsally faintly 7- or 9-nerved, herbaceous and straw-colored or reddish-brown on both sides, the costa green, 3-nerved. Achenes oblong-obovate, suddenly contracted at mucronate apex, trigonous, 1.3-1.5 mm. long, maturing dark brown, punctulate; style 1.5 mm. long, 3-cleft above for $\frac{1}{4}$ its length.

GENERAL DISTRIBUTION: Endemic to southern Florida and the West Indies.

DISTRIBUTION IN LESSER ANTILLES: St. Thomas, St. Croix.

HEMICARPHA Nees & Arnott

Hemicarpha Nees & Arnott ex Nees in Edinb. New Philos. Jour. 17: 263. 1834. FIGURE 59.

Spikelets with numerous glumes densely imbricated on a continuous indeterminate rhachilla. Each glume subtending a small hyaline inner scale and a hermaphroditic flower; inner scale inserted between the flower and the rhachilla. Stamens 1 or 2 to a flower. Achenes obovate-oblong, nearly terete; stigmas 2.

Small annual sedges tufted with fibrous roots. Culms not noded, leaved only at base. Leaves usually 2 to a culm. Inflorescence a head with 1-several sessile spikelets, subtended by involucre bracts.

TYPE SPECIES: *Hemicarpha isolepis* Nees.

About three species in North and South America; a single species occurs in the Lesser Antilles.

1. *Hemicarpha micrantha* (Vahl) Pax in Engler & Prantl, Nat. Pflanzenfam. II, 2: 105, fig. 113F. 1888.

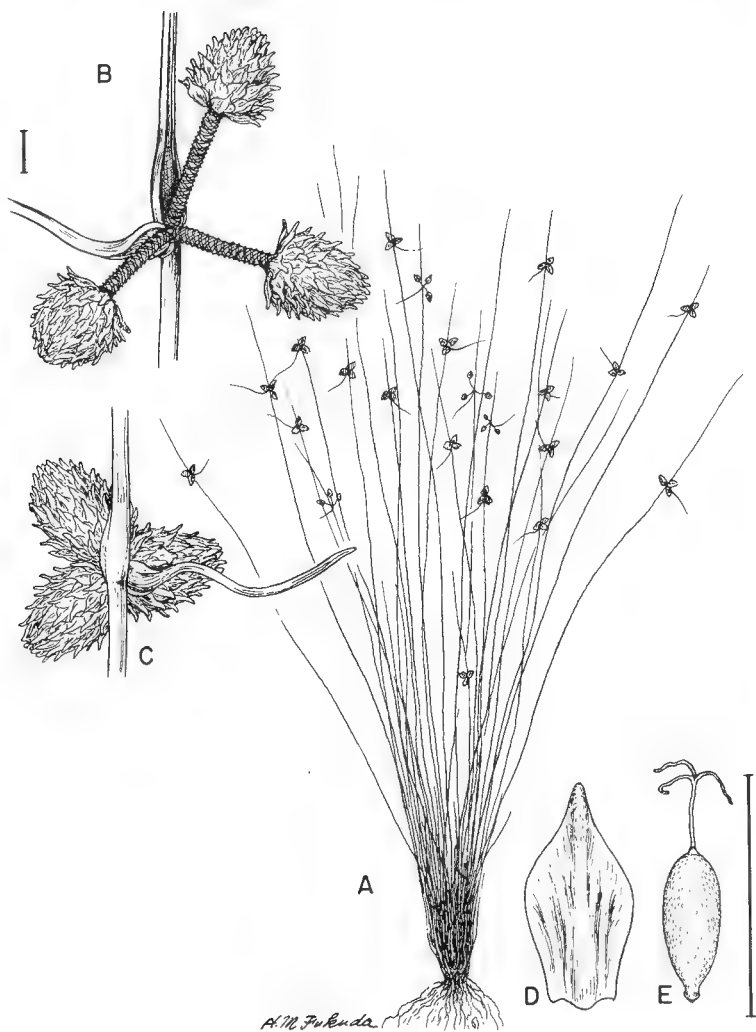


FIGURE 59. Cyperaceae. a-e, *Hemicarpha micrantha*: a, habit; b, spikes with lower spikelets fallen off; c, inflorescence; d, bracteole (subtending a spikelet); e, achene with style. Bar scales (for floral parts) = 1 mm.

Basionym: *Scirpus micranthus* Vahl, Enum. Pl. 2: 254. 1806; C. B. Clarke in Urban, Symb. Antill. 2(1): 94. 1900.

Type locality: "America meridionalis."

Syn.: *Hemicarpha subsquarrosa* Nees in Martius, Fl. Brasil. 2(1): 61, t. 4, f. I. 1842. (Type locality: Brazil.)

Small, slender annual, densely tufted with fibrous roots. Culms slender, (2-)5-20 cm. tall, ca. 0.3 mm. thick, obtusely trigonous, smooth, 2- or 3-leaved at base. Leaves much shorter than culms, often reduced into almost bladeless sheaths; blades narrowly linear, 0.3-0.5 mm. wide, flattish, smooth, somewhat obtuse at apex, 0.5-10.0 cm. long; sheaths 5-25 mm. long, reddish-brown or light brown, obliquely truncate at orifice. Inflorescence a head with 1-4 spikelets, pseudolateral; involucre bracts usually 2, the lower erect, 1-4 cm. long, culmlike, the upper divergent to reflexed, 0.5-1.0 cm. long. Spikelets ovoid, terete, 3-4 mm. long, 1.5-2.0 mm. across, somewhat obtuse at apex, brownish-green, densely many-flowered. Glumes numerous, densely imbricate, rhombic-obovate, acute at apex, shallowly boat-shaped, 0.7-1.0 mm. long, herbaceous, light green and variegated or tinged with chestnut-brown on both sides, the keel green, ending in a short upright mucro. Inner scale inserted between achene and rachilla, hyaline, oblanceolate. Achene obovate-oblong, 0.5-0.6 mm. long, thickly plano-convex to nearly terete, cuneate at base, contracted to apiculate apex, brown, punctulate; stigmas 2.

GENERAL DISTRIBUTION: From the United States south to tropical South America; also in tropical Africa (Angola).

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe, Martinique!.

CLADIUM P. Browne

Cladium P. Browne, Hist. Jamaica 114. 1756.

Spikelets ovoid, bearing 6-8 glumes on markedly flexuose rachilla; glumes irregularly spirally disposed, the lower 4-6 empty and smaller than the upper 2, both bearing a hermaphroditic flower, only the upper flower producing an achene. Stamens 2. Achene ovoid, subterete, the wall thick and corky; stigmas 3. Hypogynous bristles absent.

Large robust perennials with elongated, many-nodose culms, often bearing extra-vaginal shoot at lower nodes. Leaves cauline; blades broadly linear, flat, pseudodorsiventral, strongly serrulate-scabrous on margins, long-sheathing at base. Inflorescence paniculate, consisting of several terminal and lateral compound corymbs with many elongated rays. Spikelets clustered in small heads terminating ultimate raylets.

TYPE SPECIES: *Cladium jamaicense* Crantz.

Four species in tropical and warm-temperate parts of Eurasia, the Pacific islands and North and South America. A single species is found in the Lesser Antilles.

1. *Cladium jamaicense* Crantz, Instit. 1: 362. 1776; C. B. Clarke in Urban, Symb. Antill. 2(1): 134. 1900.

Type locality: Jamaica.

Syn.: *Cladium mariscus* (L.) Pohl subsp. *jamaicense* (Crantz) Kükenthal in Fedde Rep. Sp. Nov. Beih. 40(1): 523. 1938.

Cladium occidentale sensu Griseb., Fl. Br. W. Ind. Isl. 573. 1864, non Schrader.

Tall perennial with thick horizontal rhizome. Culm solitary, 1-3 m. tall, terete, many-nodose, often bearing extra-vaginal shoot at lower nodes. Leaves cauline; blades elongated, broadly linear, flat, 60-90 cm. long, 8-15 mm. wide, thickly coriaceous, gradually tapering above to 3-sided, caudate apex, strongly serrulate-scabrous on margins; sheaths shorter than the internode. Inflorescence 30-90 cm. long, with 5-9 terminal and lateral corymbs, these rather contiguous or the lower ones spaced; bracts leafy, sheathing at base, the lower bract-blades much surpassing their subtending corymbs; corymbs 4-8 cm. long and as broad, the peduncle and rays flattened. Spikelets congested in globose heads of 4-12 which are 4-9 mm. in diameter, the spikelets ovate-elliptic to broadly so, 3 mm. long, 2 mm. wide, rusty brown. Glumes 6-8, broadly ovate, suddenly contracted above to obtuse or subacute apex, the lower 4-6 empty, each of the apical 2 bearing a bisexual flower, the upper flower only producing an achene. Stamens 2. Achenes ovoid-globose, 1.8-2.0 mm. long, brown, rounded at base, apiculate at apex; stigmas 3.

GENERAL DISTRIBUTION: Tropical and subtropical North and South America. Subspecies *chinense* is distributed similarly in the Old World tropics, hence forming a pantropic range as a species.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe, Dominica!, St. Lucia!, Grenada!.

MACHAERINA Vahl

Machaerina Vahl, Enum. Pl. 2: 238. 1806.

FIGURE 60.

Spikelets laterally flattened, bearing 4-10 glumes distichously disposed on a zigzag axis. Glumes chartaceous to thickly herbaceous, boat-shaped with a distinct keel, often ciliolate-margined; lowest 1-3 glumes empty and smaller than the remainder. Flowers 2-6 to a spikelet, all bisexual but uppermost 1-few occasionally not fruit-bearing. Hypogynous bristles 6-3, sometimes absent, capillary, spinulose-scabrous mostly above the middle. Achenes ovate to lance-ovate or elliptic, trigonous to nearly 3-winged, stipitate at base; style elongated, the base as a rule forming a conical enlargement (style-base); stigmas 3.

Medium-sized or large perennial with scaly rhizomes, often stoloniferous. Culms solitary, leaved at base, ancipitous to subterete, normally 1- or 2-nodose above the radical leafy part. Leaves 2-ranked, the blades ancipitous, strongly flattened bilaterally with sharp edges or becoming subterete and

unifacial, sheathing at base. Inflorescence a terminal compound panicle with 2-several partial fasciculate panicles, open or contracted, usually colored with purple- or sanguineous-brown. Spikelets clustered in groups of 2-6, the clusters turbinate or spherical.

TYPE SPECIES: *Machaerina restioides* (Swartz) Vahl, based on *Schoenus restioides* Sw.

About 50 species in tropical and temperate regions of both hemispheres with high species concentration in southern Pacific islands and Australia. A single species is found in the Lesser Antilles.

1. *Machaerina restioides* (Swartz) Vahl, Enum. Pl. 2: 238. 1806.

Basionym: *Schoenus restioides* Swartz, Prodr. 19. 1788.

Type: *Ryan*, Montserrat.

Syn.: *Cladium restioides* (Swartz) Bentham ex C. B. Clarke in Urban, Symb. Antill. 2(1): 135. 1900.

Perennial, subloosely tufted. Rhizome decumbent, covered with greyish-brown scales, up to 6 cm. long. Culms 35-140 cm. tall, laterally compressed, 2-6 mm. wide, few-nodose. Leaves rather many, 2-ranked, ancipitous, mostly basal with 2 or 3 cauline above; blades linear-falcate, 15-90 cm. long, 5-15 mm. wide; stiff, glabrous, acute; sheaths equitant, 10-20 cm. long, reddish to cinnamon-colored. Inflorescence with 3-5 subcontiguous, fascicled panicles, 30-60 cm. long; leafy bracts of lateral panicles much shorter than the subtending panicle; branches 3- to 7-nate, 7-20 cm. long, each bearing 3-18 clusters of spikelets. Clusters of spikelets turbinate, 5-8 mm. wide, bearing 2-6 sessile spikelets. Spikelets 4-5 mm. long, 2- to 5-flowered, 2- to 4-fruited; glumes 2-ranked, lance-oblong, 3.7-4.5 mm. long, keeled, suddenly contracted at acute or subobtuse apex, chartaceous, dark sanguineous, ciliate on membranous margins, dorsally roughened-puberulent. Achenes elliptic, 1.7-2.0 mm. long including beak, triquetrous, attenuate below to short-stipitate base, maturing shiny red-brown, irregularly rugose-punctate; style-base conical, 0.3-0.6 mm. long, hispid with white prickles; style 2.0-2.5 mm. long, 3-cleft. Hypogynous bristles 6, 0.7-2.3 mm. long, light brown, scabrous above for $\frac{1}{2}$ - $\frac{2}{3}$ its length with sparsely distributed spinules.

GENERAL DISTRIBUTION: Endemic to the West Indies.

DISTRIBUTION IN LESSER ANTILLES: Montserrat, Nevis!, Guadeloupe!, Martinique!, St. Vincent!.

RHYNCHOSPORA Vahl

***Rhynchospora* Vahl, Enum. Pl. 2: 229. 1806, nom. cons. FIGURES 61, 62.**

Dichromena Michaux, Fl. Bor.-Amer. 1: 37. 1803.

Spikelets lanceolate, ovate, or elliptical, terete or slightly compressed, brown or white, consisting of few to many glumes distichously disposed or

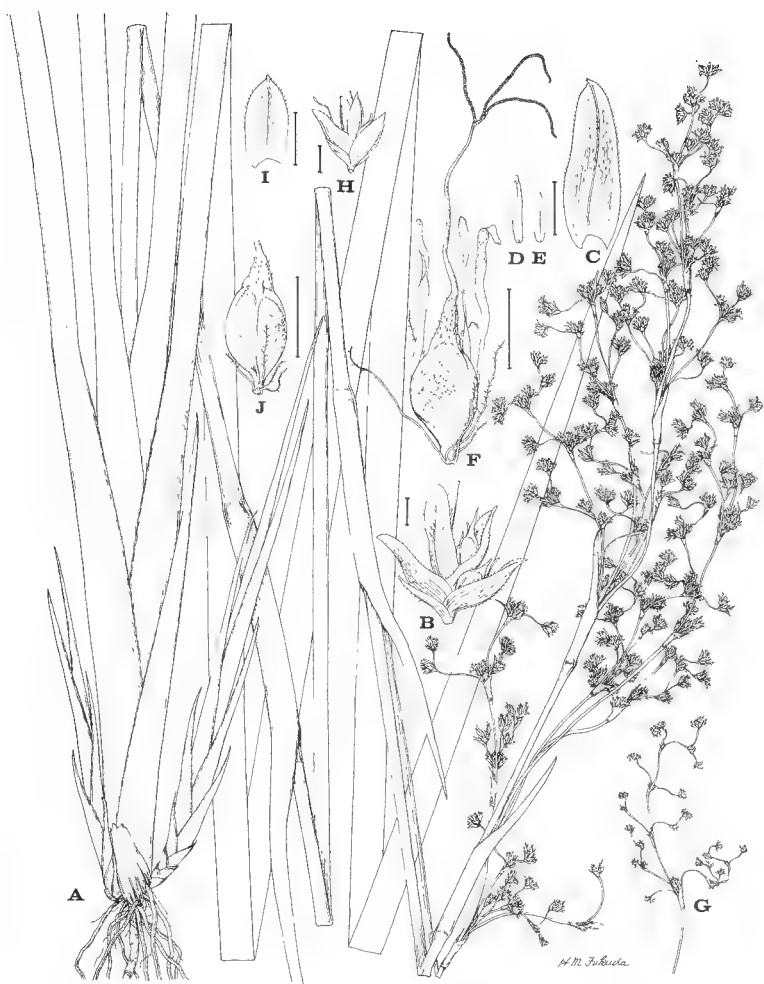


FIGURE 60. Cyperaceae. a-j, *Machaerina restioides*. a-f, *M. restioides* subsp. *restioides*: a, habit; b, spikelet; c, floral glume; d, e, anthers; f, achene with pistil, dead filaments and hypogynous bristles. g-j, *M. restioides* subsp. *effusa*: g, portion of inflorescence; h, spikelet; i, floral glume; j, achene with hypogynous bristles. Bar scales (for floral parts) = 1 mm.

somewhat imbricate on a continuous simple axis; 1-several flowers borne at the axil of lower glumes, hermaphroditic and fruit-bearing; 1-few staminate flowers borne at the axil of upper glumes; uppermost few glumes occasionally empty. Glumes 1-costate. Flowers bisexual or staminate due to the abortive pistil; hypogynous bristles 6, more rarely absent, upwardly or retrorsely scabrous or smooth; achenes lenticular, crowned with a persistent conical style-base; styles 2-cleft or undivided.

Perennial or occasionally annual sedges of various size. Culms scapelike or nodose and leaved. Leaves linear, the sheaths eligulate. Inflorescences terminal and lateral, corymbose, paniculate or congested in head.

TYPE SPECIES: *Rhynchospora alba* (Linnaeus) Vahl, based on *Schoenus albus* Linn., typ. cons.

About 250 species from tropical to subarctic regions of both hemispheres with the greatest concentration of species in tropical America.

KEY TO THE SPECIES

1. Floral glumes and spikelets brown or rusty brown. 2
- 1a. Floral glumes and spikelets white or whitish-stramineous. 10
2. Styles conspicuously 2-cleft. 3
- 2a. Styles undivided or very shallowly 2-lobed at very apex. 8
3. Hypogynous bristles present. 4
- 3a. Hypogynous bristles absent. 6
4. Styles elongate, 3-6 mm. long; spikelets lanceolate to ovate-lanceolate, hardly plump. 5
- 4a. Styles short, ca. 1 mm. long; spikelets ellipsoidal, markedly plump. 3. *R. globularis*
5. Corymbs densely bearing many branches; achenes 1.2-1.5 mm. long. 1. *R. marisculus*
- 5a. Corymbs loosely bearing few branches; achenes 2 mm. long. 2. *R. rugosa*
6. Spikelets broadly obovate, 1.0-1.5 mm. long; achenes 0.5-0.7 mm. long; annual with fibrous roots only. 6. *R. micrantha*
- 6a. Spikelets lanceolate, 4.0-5.5 mm. long; achenes 1-2 mm. long; perennials. 7
7. Achenes 1 mm. long; style-base depressed-conical, very shallowly 2-lobed with lobes decurrent on upper angles of achene. 4. *R. tenuis*
- 7a. Achenes 1.8-2.0 mm. long; style-base 3-toothed with the lobes upwardly curved. 5. *R. tenerrima*
8. Spikelets 7-11 mm. long, subloosely to subdensely clustered in corymbose fascicles, some spikelets short-pedicelled; leaves 8-20 mm. wide. 9
- 8a. Spikelets 4-6 mm. long, congested in spherical heads, sessile; leaves 3-7 mm. wide. 9. *R. holoschoenoides*
9. Achenes 3.0-3.5 mm. long, deeply furrowed; spikelets 1-fruited, the rhachilla with short internodes. 7. *R. corymbosa*
- 9a. Achenes 1.5-1.8 mm. long, biconvex; spikelets bearing 2 fruits, the rhachilla with elongated internodes. 8. *R. longiflora*
10. Inflorescence with 4-7, spaced, pyramidal panicles; culms up to 100 cm. tall, several-nodose; bladed leaves crowded on the mid-portion of the culm; basal leaves reduced to bladeless sheaths. 10. *R. polyphylla*

- 10a. Inflorescence a terminal head or a short spike; culms scapellike, leaved only at base, not nodose above leafy base. 11
- 11. Inflorescence a short spike; the lowest bract equaling to slightly longer than the inflorescence; culms capillary, up to 6 cm. tall. 11. *R. pusilla*
- 11a. Inflorescence a hemispherical head; the lower involucrel bracts much longer than the head; culms not capillary, 8-60 cm. tall. 12
- 12. Involucrel bracts monochromatic, green at base; plants without conspicuous rhizome. 12. *R. radicans*
- 12a. Involucrel bracts bicolored, white at base; plants with conspicuous rhizomes. 13
- 13. Involucrel bracts glabrous at base; culms not tufted. 13. *R. stellata*
- 13a. Involucrel bracts ciliate at base; culms more or less tufted. 14
- 14. Rhizome elongate, ascending, emitting slender stolons; leaves 1-2 mm. wide, shorter than to equaling the culms. 14a. *R. nervosa* subsp. *nervosa*
- 14a. Rhizome short, not emitting stolons; leaves 2-4 mm. wide, shorter than to overtopping the culms. 14b. *R. nervosa* subsp. *ciliata*

1. **Rhynchospora marisculus** Nees [in Linnaea 9: 24. 1834, nomen nudum] in Martius, Fl. Brasil. 2(1): 142. 1842; C. B. Clarke in Urban, Symb. Antill. 2: 132. 1900, pro parte, excl. syn. *R. odorata* Wright; Gale in Rhodora 46: 273, t. 835, f. 3A & B. 1944; Kükenthal in Engl. Bot. Jahrb. 75: 137. 1950.

Type: Brazil, Sebastianopoli, *Martius 3193* (lectotype, M).

Tufted, tall perennial with short to sometimes slightly elongated rhizome. Culms 60-160 cm. tall, 1-3 mm. thick, triquetrous, rigid, remotely 4- or 5-nodose. Leaves many, mostly aggregated at culm bases, upper ones spaced on the culm; blades narrowly linear, shorter than culms, 3-7 mm. wide, subcoriaceous, somewhat flat, acute-tipped; sheaths of basal leaves brown, eventually disintegrating into parallel fibers; cauline leaf sheaths greenish. Inflorescence with 2-4 corymbs, 20-30 cm. long, dense; corymbs spaced or the uppermost two contiguous, decompound with many slender branches, usually more or less nodding or inclined, terminal corymb 7-10 cm. long, 3-4 cm. wide, lateral corymbs on a long-exserted peduncle; branches up to 3 cm. long; bracteoles setaceous. Bracts leafy, sheathing at base, the blade up to 10 cm. long, shorter than the subtending corymb. Spikelets fasciculate-congested, solitary on short pedicels, lanceolate, acute, 5-7 mm. long, 0.8-1.2 mm. wide, 2- to 4-flowered, usually 2-fruited. Glumes 6-9, lance-elliptic to narrowly lance-oblong, mucronate, 1-nerved, the sides brown to reddish-brown, white-hyaline-margined, the fruit-bearing glumes 3-4 mm. long. Achenes obovate to narrowly obovate, 1.1-1.3 mm. long, 0.75-0.80 mm. wide, attenuate at base, the sides yellowish-brown, shiny, obscurely transversely wrinkled with longitudinally oblong cells; style-base subulate to conical-subulate, about as long as the achene or slightly shorter, the base as wide as the truncate apex of the achene-body; style deeply bifid at apex to more than $\frac{1}{3}$ its length, 3-4 mm. long including the base. Hypogynous bristles 6 or 7, slender, ca. twice as long as the achene, upwardly scabrous.

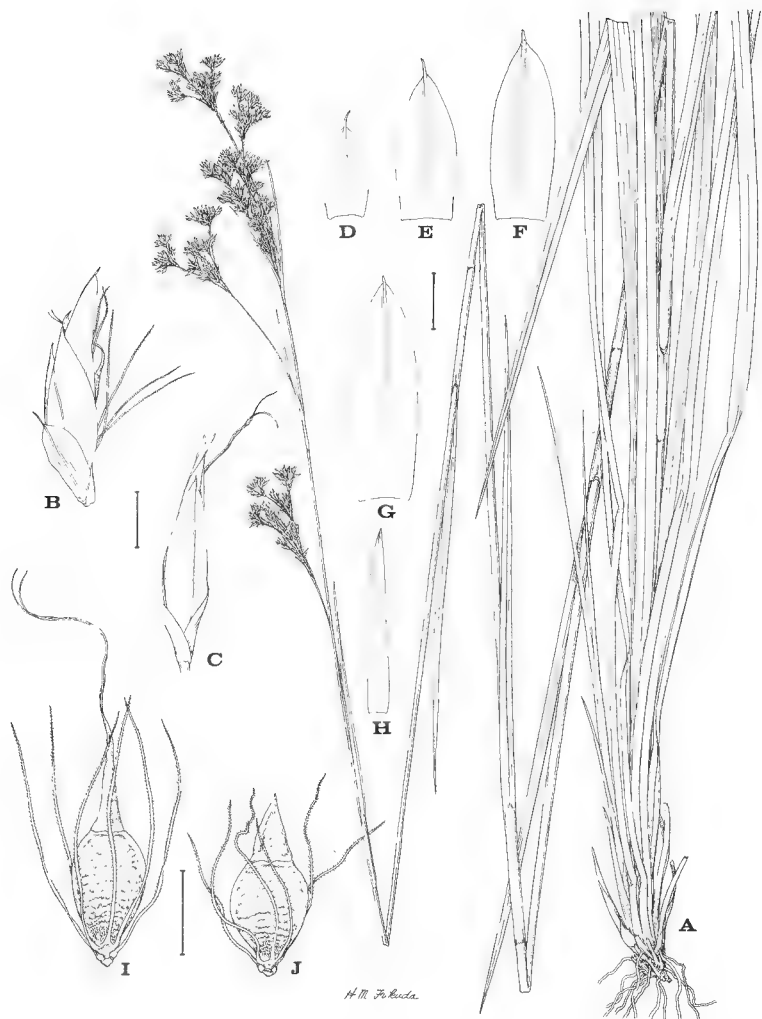


FIGURE 61. Cyperaceae. a-j, *Rhynchospora marisculus*: a, habit; b, c, two views of spikelet; d-h, glumes (f and g, nut-bearing glumes); i, j, two achenes with hypogynous bristles and style-base. Bar scales (for floral parts) = 1 mm.

GENERAL DISTRIBUTION: Rather widely distributed from Central America (Guatemala) and West Indies, through all of tropical South America south to northern Argentina.

DISTRIBUTION IN LESSER ANTILLES: St. Lucia, Dominica!

2. *Rhynchospora rugosa* (Vahl) Gale in Rhodora 46: 275, t. 835, f. 1A, B. 1944.

Basionym: *Schoenus rugosus* Vahl, Eclog. Amer. 2: 5. 1798.

Type: von Rohr, "America meridionalis."

Syn.: *Rhynchospora glauca* Vahl, Enum. Pl. 2: 233. 1806; C. B. Clarke in Urban, Symb. Antill. 2(1): 128. 1900; Kükenthal in Bot. Jahrb. 75: 143. 1950, nomen illeg.

Culms tufted from short rhizome, slender but rigid, 30-70 cm. tall, 3-sided, smooth, 2- or 3-noded. Leaves basal, with 2 or 3 above on the culm; blades narrowly linear, 2-4 mm. wide, shorter than the culm, folded, thinly coriaceous, gradually long-acuminate at apex, scaberulous on margins; sheaths of cauline leaves yellowish-green, basal sheaths brownish and eventually disintegrating into fibers. Corymbs 2-4, remotely located on the upper part of the culm, 2-5 cm. long and 2-3 cm. wide, subdense or subloose; rays very unequal in length, filiform, obliquely ascending, the final raylets terminated by a single spikelet or a cluster of 2-3 spikelets. Spikelets ovate-oblong, 3.0-4.5 mm. long, subcompressed, 2- or 3-flowered, bearing 1 or 2 fruits, rusty- or orange-brown; glumes ovate or broadly so, membranous, 1-nerved, acute at mucronate apex. Achenes broadly obovate, biconvex, 2 mm. long, yellow-brown, finely transversely rugose; style-base depressed-conical, half as long as the achene body; style 4-6 mm. long, 2-cleft. Hypogynous bristles 6 or 7, slightly shorter than the achene, reddish-brown, upwardly scabrid.

GENERAL DISTRIBUTION: Pantropic.

DISTRIBUTION IN LESSER ANTILLES: Nevis!, Dominica.

Proctor's recent collection no. 19432(A) from Nevis, between Gingerland & Iron Gate, is the only documentation of this species from the Lesser Antilles.

3. *Rhynchospora globularis* (Chapm.) Small [Man. Southeast. Fl. 184. 1933, comb. invalida] ex Gale in Rhodora 46: 243, pl. 831, f. 1A, B. 1944; Kükenthal in Bot. Jahrb. 75: 156. 1950.

Basionym: *Rhynchospora cymosa* Nuttall var. *globularis* Chapm., Fl. South. U. S. 525. 1860; Britton in Trans. N. Y. Acad. 11: 91. 1892.

Type locality: Florida.

Syn.: *Rhynchospora cymosa* sensu C. B. Clarke in Urban, Symb. Antill. 2(1): 129. 1900, non Elliott, 1816.

Rhynchospora globularis Small var. *recognita* Gale in Rhodora 46: 245, pl. 831, f. 4A, B. 1944. (Type: Fernald & Long 6070, Virginia.)

Rhynchospora globularis Small var. *pinetorum* (Britt. & Small) Gale in Rhodora 46: 248, pl. 831, f. 5A. 1944.

Rhynchospora pinetorum Britton & Small in Small, Man. 183. 1933. (Type: Florida, pinelands W on Punta Gorda, Small, Mosier & DeWinkler 10912.)

Tufted in small clumps. Culms slender, 20-90 cm. tall, stiff, smooth. Leaves mostly radical and subradical with 1 or 2 cauline above, much shorter than the culm, narrowly linear, 1.5-2.5 mm. wide, flattish-plicate; sheaths pale, the basal ones eventually disintegrating into brown fibers. Panicles 1-4, very widely spaced, subloose or more frequently subdense; terminal corymb 2-6 cm. long, with few to several rather short rays 0.5-6.0 cm. long, the lateral panicles smaller and on a slender long-exserted peduncle; leafy bracts shorter than to longer than the subtending panicle, sheathing. Spikelets in clusters of 2-6, ovoid to broadly ovoid, 2-4 mm. long, 2- to 4-flowered, 1- to 3-fruited. Glumes 6 or 7, broadly ovate or somewhat orbicular, obtuse to somewhat emarginate at usually mucronate apex, membranous, brown, the costa 1-nerved, slender, the flower-bearing glumes 1.8-2.5 mm. long. Achenes broadly obovate, thickly biconvex, 1.2-1.5 mm. long, yellow-brown, transversely undulate with 18-23 irregular zonations of minute oblong alveoli; style ca. 1 mm. long, 2-cleft, the base depressed-conical, 0.5-0.8 mm. long, ca. $\frac{1}{2}$ as wide as the achene body. Hypogynous bristles 5 or 6, $\frac{1}{2}$ - $\frac{2}{3}$ the length of achene body, slender, upwardly scabrous.

GENERAL DISTRIBUTION: From the eastern United States, south of Delaware, southwestward to California, through the West Indies to northern Argentina.

DISTRIBUTION IN LESSER ANTILLES: Martinique!, Dominica!.

According to Gale (1944) the plants from the Lesser Antilles belong to var. *recognita*, which is said to differ from the typical phase in the longer dimensions of achenes (1.3-1.6 mm. vs. 1.2-1.3 mm.), spikelets (2-3 mm. vs. 3-4 mm.) and culms (14-68 cm. vs. 15(rarely)-92 cm.) From my observation, no clear discontinuity was noted in any of these measurements; therefore, I am unable to recognize this variety.

4. *Rhynchospora tenuis* Link in Spreng., Jahrb. Gewächskunde 1, Heft 3: 76. 1820; C. B. Clarke in Urban, Symb. Antill. 2(1): 118. 1900; Kükenthal in Bot. Jahrb. 75: 188. 1950.

Type: Not determined.

Syn.: *Dichromena cubensis* Kunth, Enum. Pl. 2: 281. 1837. (Type: Poeppig, Cuba.)

Rhynchospora cubensis (Kunth) Griseb., Fl. Br. W. Ind. Isl. 576. 1864.

Rhynchospora tenuis Link var. *brevinix* Kükenthal in Fedde Rep. Sp. Nov. 23: 207. 1926. (Type: Syntype consisting of Martinique, Duss 693, 4144, 4519, 4716, and St. Kitts, Britton & Cowell 564.)

Rhizome short and knotty, covered with brown fibers. Culms densely tufted, slender, rigid, 10-25 cm. tall, trigonous, smooth, 1-furrowed on each side. Leaves radical and 1 or 2 on culms; blades shorter than the culm,

narrowly linear, 1-2 mm. wide, canaliculate at base, gradually long-acuminate at apex; sheaths 1-4 cm. long, straw-colored or greyish-brown. Inflorescence consisting of 2 or 3 corymbs remotely borne on the upper half of the culm; terminal corymb compound, 1.0-2.5 cm. wide, 1.0-1.5 cm. high, subdensely bearing many spikelets; bracts 2 or 3, surpassing the corymb; lateral corymbs 7-10 mm. wide, 6-8 mm. high, dense, the peduncle 1.5-2.5 cm. long, enclosed in bract sheath for most of its length; bract elongated, leaflike, up to 10 cm. long, surpassing the inflorescence, the sheath 1.0-1.5 cm. long. Spikelets fascicled in a group of 2 or 4, nearly sessile, lance-oblong, 4-5 mm. long, subterete, 3- to 4-flowered, but only the lowest flower maturing. Glumes 6 or 7, ovate or ovate-elliptic, membranous, straw-brown and brown-lineolate, whitish on broad hyaline margin, the lowest two glumes empty and mucronate, the others muticous. Achenes obovate-orbicular, 1 mm. long, biconvex, yellowish-brown and later becoming dark brown, coarsely transversely undulate-rugose; style-base depressed-deltoid, 0.2 mm. long, very shallowly 2-lobed at base with lobes decurrent on the upper edges of the achene; style 2-cleft. Hypogynous bristles absent.

GENERAL DISTRIBUTION: Tropical America from Mexico and the West Indies south to northern Argentina.

DISTRIBUTION IN LESSER ANTILLES: Dominica, Martinique!, St. Vincent.

5. *Rhynchospora tenerrima* Nees ex Spreng., Syst. Veg. 4(2), Cur. post. 26. 1827; C. B. Clarke in Urban, Symb. Antill 2(1): 120. 1900.

Type: *Sieber 116*, from "Nov. Holl." (an error—actually West Indies).

Syn.: *Schoenus setaceus* Bergius, Act. Helv. 7: 130, t. 9. 1772. (Type locality: Surinam.)

Rhynchospora spermodon Griseb., Fl. Br. W. Ind. Isl. 576. 1864. (Type locality: Cuba.)

Rhynchospora setacea (Berg.) Böckl. in Vidensk. Meddel. Naturhist. Foren. Kjøb. 1869(9-13): 159. 1869; Duss in Ann. Inst. Col. Marseille 3: 551. 1897; Kükenthal in Bot. Jahrb. 75: 289. 1951, non Vahl, 1806.

Culms densely tufted with fibrous roots, slender, 5-40 cm. tall, smooth. Leaves few to a culm, filiform, canaliculate, shorter than to briefly overtopping the culm; sheaths rather short, brownish. Corymbs 2-4, much spaced, 1-3 cm. long, 1-2 cm. wide, loosely few-branched, bearing 3-6 spikelets; bracts much longer than the subtending corymb, sheathing at base. Spikelets solitary or 2 or 3 together, lanceolate, subterete, 4.0-5.5 mm. long, bearing 7 or 8 glumes, 3- or 4-flowered, 1- or 2-fruited. Glumes ovate to lance-ovate, acute, thinly chartaceous, straw-brown with purple-brown flecks, the keel 1-nerved, slender, projecting beyond glume apex forming a short awn up to 2 mm. long; basal few glumes small and empty, the flower-bearing ones 4-5 mm. long. Achenes obovate in outline, 1.8-2.0 mm. long including 0.5 mm.-long stipe, thickly biconvex, maturing brown, transversely undulate with 3-8 wrinkles and minutely longitudinally lineolate; style filiform, ca. 2 mm. long, 2-cleft; style-base dilated with up-

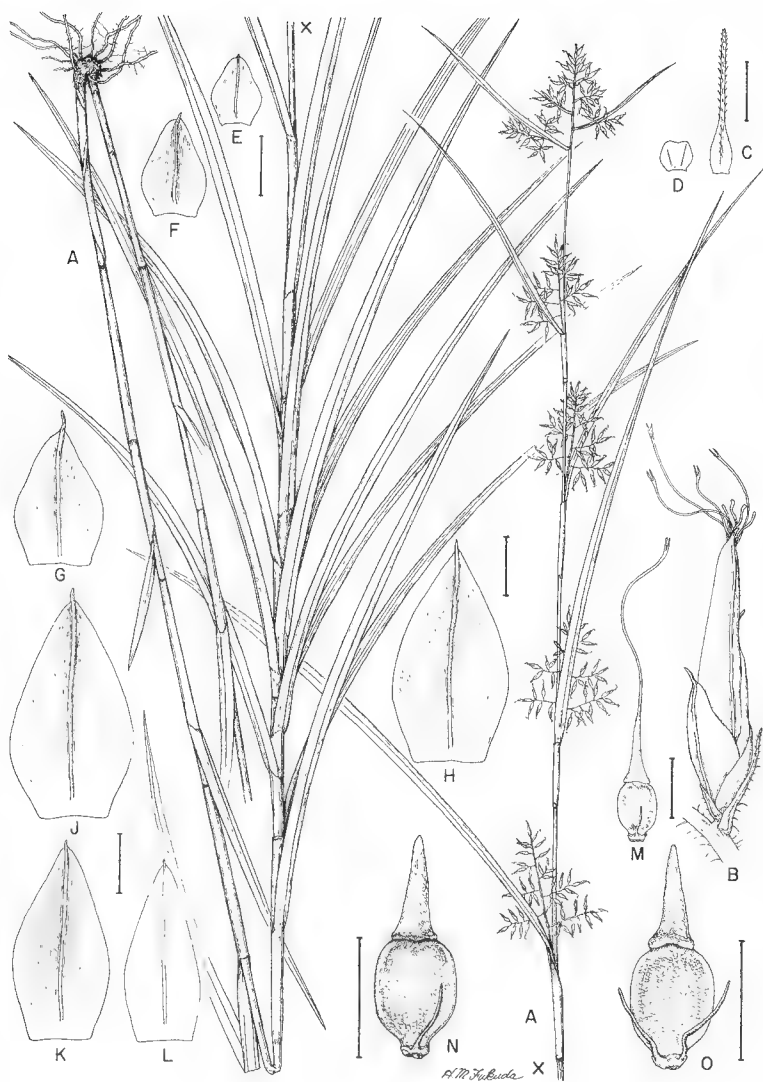


FIGURE 62. Cyperaceae. a-o, *Rhynchospora polyphylla*: a, habit; b, spikelet; c, bract; d, prophyll at base of spikelet; e-l, floral glumes (from the lowest, e); m, fruiting pistil; n, o, two views of achene with style-base and hypogynous bristles. Bar scales (for floral parts) = 1 mm.

wardly curved margins, hence forming a 3-toothed structure. Hypogynous bristles absent.

GENERAL DISTRIBUTION: The West Indies and tropical South America from eastern Colombia and Venezuela south to eastern Bolivia and Brazil.

DISTRIBUTION IN LESSER ANTILLES: Nevis!, Antigua, Montserrat!, Guadeloupe, Dominica, Martinique!, St. Lucia!, St. Vincent!, Grenada!.

6. *Rhynchospora micrantha* Vahl, Enum. Pl. 2: 231. 1806; Griseb., Fl. Br. W. Ind. Isl. 576. 1864; Duss in Mem. Inst. Col. Marseille 3: 552. 1897; C. B. Clarke in Urban, Symb. Antill. 2(1): 117. 1900.

Syntypes: *Richard*, Georgia, and *West*, Puerto Rico.

Small annual with fibrous roots. Culms tufted in small clumps, setaceous, 5-30 cm. tall, striate, smooth. Leaves basal, few to a culm; blades narrowly linear, shorter than or equaling the culm, 1-2 mm. wide, soft, light green; sheaths light brownish. Corymbs 3-5, compound, open, remotely borne on the culms except at very base; bract of lateral corymb leaflike, overtopping the inflorescence, the sheathing base 4-8 mm. long; bract of terminal corymb setaceous, up to 2 cm. long, hardly sheathing; corymb-rays spreading, 0.6-1.0 cm. long, capillary, each terminated by a headlike cluster of spikelets. Spikelets broadly obovoid, 1.0-1.5 mm. long, 2- or 3-flowered and the lower 1 or 2 flowers maturing into achenes. Glumes few, lance-ovate, the fruit-bearing ones ca. 1 mm. long, membranous, pale and brown-lineolate, the costa green, ending in a mucro. Achenes obovate-orbicular, 0.5-0.7 mm. long, biconvex, straw-brown, marginate on edges, transversely coarsely undulate-rugose, short-stiped at base; style-base depressed-conical, the basal lobes decurrent on upper edges of achene; style 2-fid. Hypogynous bristles absent.

GENERAL DISTRIBUTION: Tropical America from Mexico and the West Indies south to northern Argentina.

DISTRIBUTION IN LESSER ANTILLES: Antigua!, Guadeloupe!, Dominica, Martinique!, St. Lucia!, St. Vincent!, Grenada!.

7. *Rhynchospora corymbosa* (L.) Britton in Trans. N. Y. Acad. Sci. 11: 84. 1892. Kükenthal in Bot. Jahrb. 74: 410. 1949.

Basionym: *Scirpus corymbosus* L., Cent. Pl. 2: 7. 1756.

Type locality: Jamaica.

Syn.: *Rhynchospora aurea* Vahl, Enum. Pl. 2: 229. 1806; Duss in Ann. Inst. Col. Marseille 3: 550. 1897; C. B. Clarke in Urban, Symb. Antill. 2(1): 110. 1900, nom. illeg.

Schoenus surinamensis Rottb., Descr. Pl. Rar. Progr. 14. 1772; Descr. Icon. Rar. Nov. Pl. 68, t. 21, f. 1. 1773. (Type: *Rolander*, Surinam.)

Rhynchospora surinamensis (Rottb.) Nees in Linnaea 9: 297. 1834; Griseb., Fl. Br. W. Ind. Isl. 575. 1864.

Culm arising from short but thick rhizome, 80-120 cm. tall, 3-sided, several-nodose, leaved, scaberulous on angles on the upper part. Leaves many, aggregated at the base of the culm with several above on the culm; blades broadly linear, 8-20 mm. wide, flattish, herbaceous or thinly coriaceous, gradually long-acuminate at apex; sheaths elongated, the basal ones straw-brown or light brown. Corymbs 2-4, on the upper part of the culm, compound or decompound, rather contiguous, 10-15 cm. long and as broad; bracts leaflike, shorter than to much longer than the corymb, sheathing at base; corymb-rays many, the longer up to 12 cm. long; final raylets terminated by a cluster of 2-5 spikelets. Spikelets lanceolate or elliptical, terete, 7-10 mm. long, rusty- or orange-brown, bearing 1 fruit; glumes obscurely 2-ranked, the lower ones ovate, the upper ones oblong-ovate, 2.5-6.0 mm. long, membranous, light brown, 1-nerved, acute at muticous apex. Achenes obdeltoid-obovate, 3.0-3.5 mm. long, yellow-brown, dull, finely transversely wrinkled in median portion, coarsely undulate-rugose toward margins; style-base elongate-conical, as long as or slightly longer than the achene body, furrowed in the median portion; style elongated, scarcely divided at apex. Hypogynous bristles 6, 4-5 mm. long, brown, upwardly scabrid.

GENERAL DISTRIBUTION: Pantropic.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe!, Dominica, Martinique!, Grenada.

8. *Rhynchospora longiflora* Presl [in Oken Isis 21: 269. 1828, nomen nudum] Symb. Bot. 1: 41, t. 28. 1832; Urban, Symb. Antill. 2(1): 167. 1900.

Type: *Sieber*, Martinique.

Syn.: *Rhynchospora corymbifera* Nees in Linnaea 9: 297. 1834, nomen nudum ex Steud., Syn. Pl. Glum. 2: 148. 1855; Britton in Trans. N. Y. Acad. 11: 85. 1892; Duss in Ann. Inst. Col. Marseille 3: 550. 1897; C. B. Clarke in Urban, Symb. Antill. 2(1): 112. 1900. (Type: *Sieber* 69, Martinique.)

Rhynchospora florida Griseb., Fl. Br. W. Ind. Isl. 575. 1864. (Type localities: Jamaica, Dominica and Trinidad.)

Rhizome short, lignescens. Culms 50-100 cm. tall, smooth, bearing rather many leaves on lower $\frac{1}{3}$ - $\frac{1}{2}$. Leaves rather broadly linear, 8-12 mm. wide, equaling to slightly overtopping the culm, 1-costate, flattish, thinly coriaceous; sheaths greenish to straw-colored, up to 17 cm. long, loosely surrounding the culm. Corymbs 3-5, rather spaced; terminal corymb 8-12 cm. long and as broad, bearing 5-9 unequal, patent rays, the rays further branched in a somewhat fasciculate manner, and each branch bearing 5-15 pedicelled spikelets; bracteoles setaceous, slightly shorter than rays and raylets; lateral corymbs smaller than the terminal one; leafy bracts much surpassing the subtending corymb. Spikelets lanceolate to fusiform, subterete, 10-11 mm. long, 1.5-2.0 mm. wide, bearing more than 8 glumes, 4-flowered, 2-fruited. Lower 3 glumes ovate-elliptic, empty, the upper glumes

narrowly lance-oblong, 8-10 mm. long, membranous, rusty-brown, the costa 1, slender, ending in a recurved short awn. Achenes obovate, 3-sided, 1.5-1.8 mm. long, maturing yellowish-brown, minutely cancellated with over 25 rows of transversely oblong cells, rounded to subtruncate at apex; style 12-15 mm. long, the apex undivided or shallowly 2-lobed, the base subulate-conical, nearly $\frac{2}{3}$ the width of achene at very base. Hypogynous bristles 4-6, upwardly spinulose-scabrous, overtopping the achene, the longer ones up to 5 mm. long.

GENERAL DISTRIBUTION: Endemic to Mexico and the West Indies.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe!, Dominica!, Martinique!, St. Lucia!, St. Vincent.

9. *Rhynchospora holoschoenoides* (L. C. Richard) Herter in Rev. Sud-americana Bot. 9(5): 157. 1953; T. Koyama in Mem. N.Y. Bot. Gard. 23: 50. 1972.

Basionym: *Schoenus holoschoenoides* L. C. Richard in Acta Soc. Hist. Nat. Paris 1: 106. 1792.

Type: *Le Blonde*, French Guiana, Cayenne.

Syn.: *Schoenus cyperoides* Swartz, Prodr. 19. 1788, non Retz., 1786.

Rhynchospora cyperoides Mart. in Denkschr. Königl. Akad. Wiss. München 6: 149. 1816-1817; Griseb., Fl. Br. W. Ind. Isl. 574. 1864; C. B. Clarke in Urban, Symb. Antill. 2(1): 109. 1900.

Rhizome short or decumbent. Culms usually solitary, 40-100 cm. tall, 1-3 mm. thick below, smooth. Leaves mostly basal, with 1-3 cauline above, usually shorter than the culm, folded, 3-7 mm. wide; sheaths pale or the basal ones light brownish. Corymbs 1-3, nearly umbelliform, spaced; terminal corymb semicompound, bearing 5-12 heads and 3-7 unequal rays, the primary rays patent, up to 5 cm. long, each terminated by a single head or a secondary corymb with 2-4 heads, the leafy bracts of terminal corymb 2 or 3, shorter than to nearly equaling the corymb; lateral corymbs with fewer rays and heads on a long-exserted peduncle, usually simple, the leafy bracts as a rule surpassing the subtending corymb; heads globose, 8-12 mm. across, densely bearing many spikelets. Spikelets lanceolate to ovate-lanceolate, 4-6 mm. long, gradually narrowed to acute apex, 2- to 4-flowered, 1-fruited. Glumes 7 or 8, the lowest 3 or 4 narrowly ovate, much shorter than lanceolate upper ones, membranous, brown, the keel 1- or 3-nerved, greenish-brown, ending in an upright mucro; flower-bearing glumes 3.0-3.5 mm. long. Achenes broadly obovate, rounded-truncate at apex, 1.5 mm. long, thickly biconvex, maturing brown, minutely transversely wrinkled; style 3-4 mm. long, undivided or shallowly 2-lobed at apex, the base subulate, hispid-margined, ca. 0.3 mm. wide at very base. Hypogynous bristles 6, unequal, shorter than to nearly twice as long as the achene body, slender, upwardly scabrous.

GENERAL DISTRIBUTION: Tropical Africa and tropical America; in tropical America from Mexico and the Bahamas south to Brazil.

DISTRIBUTION IN LESSER ANTILLES: St. Kitts!, Guadeloupe!, Dominica, Martinique!, St. Lucia!.

10. *Rhynchospora polyphylla* (Vahl) Vahl, Enum. Pl. 2: 230. 1806; Griseb., Fl. Br. W. Ind. Isl. 575. 1864; Duss in Ann. Inst. Col. Marseille 3: 551. 1897; C. B. Clarke in Urban, Symb. Antill. 2(1): 114. 1900; Kükenthal in Bot. Jahrb. 74: 403. 1949.

Basionym: *Schoenus polyphyllus* Vahl, Eclog. Amer. 2: 5. 1798.

Type: Ryan, Montserrat.

Rhizome short but decumbent, lignescent. Culms more or less arranged in a row along the rhizome, erect, 50–100 cm. tall, 1–2 mm. thick below, more or less thickened at base, several-nodose, clothed at base with bladeless sheaths, bearing bladed leaves on the mid-portion. Leaves linear, 3–10 mm. wide, 15–40 cm. long, stiff, roughened above, gradually long-acute at apex, glabrous or slightly pilose; sheaths of cauline leaves 3–6 cm. long, dorsally membranous, stained with red-brown; basal bladeless sheaths reddish-brown. Inflorescences 30–60 cm. long, bearing 4–7 spaced panicles; panicles pyramidal, 4–8 cm. long, 2–4 cm. wide, twice or thrice branched, the primary branches 1–3 cm. long, patent to divergent, hispid-pilose, the branchlets rectangular to the primary branches, up to 6 mm. long, bearing 1–5 spikelets; bracteoles setaceous; leafy bracts of lateral panicles much surpassing the subtending panicle, long-sheathing. Spikelets lanceolate, subterete, 4–5 mm. long, pale, bearing 4–6 flowers, all fruit-bearing. Glumes lance-ovate, the lowest 1 or 2 much smaller and empty, the remainder flower-bearing, 2.7–4.0 mm. long, membranous, pale whitish to pale straw-colored, the keel slenderly 1-nerved, ending in an upright mucro. Achenes obovate-orbicular, biconvex, 0.7–0.8 mm. long, red-brown, obscurely cancellated with 5–8 rows of transversely oblong cells, rounded-truncate at apex; style 4.5–5.0 mm. long, filiform, undivided at apex, the base conical, greenish, 0.3–0.4 mm. long, ca. $\frac{2}{3}$ the width of the achene body. Hypogynous bristles much-reduced, few to absent.

GENERAL DISTRIBUTION: Tropical America, from Mexico and the West Indies south to Bolivia and Brazil.

DISTRIBUTION IN LESSER ANTILLES: St. Kitts, Nevis!, Montserrat!, Guadeloupe!, Dominica!, Martinique!, St. Lucia!, St. Vincent!, Grenada!.

11. *Rhynchospora pusilla* (Swartz) Griseb. in Götting. Abhandl. 7: 271. 1857; Fl. Br. W. Ind. Isl. 576. 1864; Urban, Symb. Antill. 2(1): 167. 1900; Kükenthal in Bot. Jahrb. 75: 303. 1951.

Basionym: *Schoenus pusillus* Swartz, Prodr. 20. 1788.

Type: Swartz, Jamaica.

Syn.: *Rhynchospora berterii* (Spreng.) C. B. Clarke in Urban, Symb. Antill. 2(1): 119. 1900.

Hypolytrum berterii Spreng., Neue Entdeck. 1: 241. 1820.

Rhizome slender, stoloniferous, the stolons clothed with stramineous sheaths. Culms more or less tufted, filiform, erect from obliquely ascending base, 3-6 cm. tall, leaved at base. Leaves shorter than to slightly overtopping the culm, canaliculate, up to 1 mm. wide, acute, pilose on upper margins and on adaxial surface toward base; sheaths straw-brown. Inflorescence a short, dense spike bearing 2-5 spikelets; lowest bract equaling to slightly longer than the inflorescence. Spikes lance-oblong, 2-3 mm. long, ca. 1 mm. wide, white, 2- or 3-flowered, 1- or 2-fruited. Glumes 6 or 7, lanceolate to lance-oblong, the flower-bearing ones 2.0-2.5 mm. long, subobtusate, slenderly 1-nerved, membranous, white. Achenes obovate-orbicular, ca. 1 mm. long, biconvex, maturing olive-yellow, minutely transversely rugose; style slender, ca. 1.2 mm. long, 2-cleft above for $\frac{1}{2}$ its length, the style-base depressed-conical, ca. 0.3 mm. long, the base nearly $\frac{1}{2}$ the width of the achene body, shallowly bilobed. Hypogynous bristles absent.

GENERAL DISTRIBUTION: Endemic to the West Indies.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe, Marie Galante!.

12. *Rhynchospora radicans* (Schlechtld. & Chamisso) H. Pfeiffer in Fedde Rep. Sp. Nov. 38: 93. 1935; Kükenthal in Bot. Jahrb. 75: 308. 1951.

Basionym: *Dichromena radicans* Schlechtld. & Chamisso in Linnaea 6: 28. 1831; C. B. Clarke in Urban, Symb. Antill. 2(1): 102. 1900.

Type: "In umbrosis prope Jalapam. Serro Colorado."

Syn.: *Rhynchospora persooniana* Griseb., Fl. Br. W. Ind. Isl. 577. 1864, excl. basionym.

Rhynchospora dussiana Böckl., Cyp. Nov. 2: 40. 1890. (Type: *Duss*, Martinique.)

Rhynchospora pubera Böckl. forma *elatior* Duss in Ann. Inst. Col. Marseille 3: 552. 1897.

Assumedly a short-lived perennial, tufted with fibrous roots only. Culms slender, 15-50 cm. tall, 0.3-0.7 mm. thick below, soft, smooth, leaved at base. Leaves slightly shorter than to overtopping the culm, 2-4 mm. wide, herbaceous, soft, gradually tapering to somewhat acute apex; sheaths pale brown. Inflorescence a head, up to 15 mm. across, bearing 1-5 spikelets, whitish-brown; involucre bracts 3-5, spreading or weakly reflexed, light green, sparingly ciliate on lower margins, the lowest bract up to 14 cm. long. Spikelets lanceolate to ovate-lanceolate, terete, 5-10 mm. long, subacute, light brownish, up to 16-flowered, all but apical few flowers fruit-bearing. Glumes imbricate, the lower ones ovate, the upper ones lance-ovate to lanceolate, 3.5-5.0 mm. long, thinly membranous, light cinnamon-colored, broadly hyaline-margined, slenderly 1-nerved, subacute at apex. Achenes obovate-orbicular to suborbicular, thickly biconvex, 1 mm. long, 2-cleft above for $\frac{2}{5}$ its length, the base nearly transversely lunate, ca. 0.25 mm. long, nearly as wide as the achene body, dark grey. Hypogynous bristles absent.

GENERAL DISTRIBUTION: From the West Indies and Mexico southward to the Guianas, Venezuela, Colombia, Ecuador, Peru, Bolivia, and northern Chile.

DISTRIBUTION IN LESSER ANTILLES: Saba, Guadeloupe!, Dominica, Martinique!, St. Lucia!, St. Vincent, Grenada!.

13. *Rhynchospora stellata* (Lam.) Griseb., in Götting. Abhandl. 7: 271. 1857; Fl. Br. W. Ind. Isl. 576. 1864; Duss in Ann. Inst. Col. Marseille 3: 553. 1897; Kükenthal in Bot. Jahrb. 75: 298. 1951.

Basionym: *Schoenus stellatus* Lam., Encycl. Méth. Bot. 1: 741. 1784.

Type locality: Martinique.

Syn.: *Schoenus coloratus* L., Sp. Pl. 1: 43. 1753, pro minore parte, quoad Sloane Hist. 1: 119, t. 78, f. 1, excl. lectotype.

Dichromena leucocephala Michx., Fl. Bor.-Amer. 1: 37. 1803; C. B. Clarke in Urban, Symb. Antill. 2(1): 99. 1900. (Type: *Bosc*, "Carolina.")

Dichromena colorata (L.) Hitchc. in Rep. Missouri Bot. Gard. 4: 141. 1893.

Rhizome stoloniferous; stolons slender, elongated, ca. 1 mm. thick, clothed with brown scales. Culms solitary, 30–60 cm. tall, slender, stiff, leaved at base. Leaves slenderly linear, 1.0–2.5 mm. wide, $\frac{1}{2}$ – $\frac{2}{3}$ the length of the culm, somewhat stiff, gradually long-acuminate at apex; sheaths greenish, but those of cataphylls tending to be brownish. Inflorescence a semispherical head 8–13 mm. across, subdensely bearing 7–18 white spikelets; involucre bracts 3–7, patent to reflexed, unequal in length, the longest 6–12 cm. long, glabrous, the basal part white. Spikelets oblong-elliptic, terete, 4–6 mm. long, 1.7–2.0 mm. wide, obtuse at apex, bearing 7–10 flowers, the lower 4–6 fruiting. Glumes ovate-oblong, obtuse, 3.0–3.7 mm. long, navicular, 1-keeled, chartaceous, white. Achenes obovate-orbicular, 1.0–1.2 mm. long, thickly biconvex, rounded to apex, maturing brown, transversely wrinkled; style 2.0–2.2 mm. long, bifid above for $\frac{1}{4}$ its length, the base depressed-conical, dark grey, ca. $\frac{1}{2}$ the width of the achene body. Hypogynous bristles absent.

GENERAL DISTRIBUTION: Temperate to tropical America, from the eastern United States (New Jersey) southwestward to Mexico and south to the West Indies and Trinidad.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe!, Marie Galante!, Martinique.

This species is easily discernible by its solitary culms and long-creeping slender rhizomes.

14. *Rhynchospora nervosa* (Vahl) Böckl. in Vidensk. Meddel. Naturhist. Foren. Kjøb. 1869(9–13): 143. 1869; Kükenthal in Bot. Jahrb. 75: 293. 1951.

Basionym: *Dichromena nervosa* Vahl, Enum. Pl. 2: 241. 1806.

Type: *von Rohr*, "America meridionalis."

Syn.: *Dichromena pura* Nees [in Linnaea 9: 291. 1834, nomen nudum; Kunth, Enum. Pl. 2: 283. 1837, nomen tantum] in Mart., Fl. Brasil. 2(1): 112. 1842. (Type: *Macrae*, St. Vincent (lectotype, K!).)
Rhynchospora pura (Nees) Griseb., Fl. Br. W. Ind. Isl. 577. 1864.
Rhynchospora vahliana Griseb., Fl. Br. W. Ind. Isl. 577. 1864, quoad descr. tantum, excl. synonym.
Dichromena ciliata Vahl var. *vahliana* C. B. Clarke in Urban, Symb. Antill. 2(1): 101. 1900, excl. basionym.

14a. *Rhynchospora nervosa* subsp. *nervosa*.

Rhizome obliquely ascending, clothed with brownish-yellow fibers, occasionally with elongated stolons. Culms slender, 8-30 cm. tall, glabrous, leaved only at base, the base thickened into a small cormlike enlargement. Leaves abundant; blades linear, 1-2 mm. broad, shorter than to equaling the culm, herbaceous, soft, gradually long-acuminate at apex, glabrous or sparsely pilose beneath; sheaths yellowish or yellowish-brown, finally disintegrated into yellow-brown fibers. Inflorescence a terminal head with 3-5 spikelets; involucre bracts 3-7, leaflike, very unequal in length, the longest one up to 7 cm. long, the shortest one 1.0-1.5 cm. long, spreading, ciliate and pilose with long hairs toward the base, the base usually snow-white or occasionally pale, slightly dilated. Spikelets lanceolate, terete, 6-8 mm. long, acute-tipped, snow-white, the lower 4-7 flowers fruit-bearing, the upper 3-5 flowers staminate. Glumes ovate to lance-ovate, 3-5 mm. long, membranous, white, somewhat acute at apex, 1-costate, scabrid on upper costa. Achenes broad- to orbicular-obovate, biconvex, 1.0-1.3 mm. long excluding the style-base, rusty-brown, transversely wrinkled; style-base broadly conical, 0.4-0.5 mm. long; style filiform, 2-cleft at apex. Hypogynous bristles absent.

GENERAL DISTRIBUTION: Widely distributed in tropical America from Mexico and the West Indies south to Chile and northern Argentina.

DISTRIBUTION IN LESSER ANTILLES: Montserrat!, Guadeloupe, Dominica!, Grenada.

14b. *Rhynchospora nervosa* subsp. *ciliata* (Vahl) T. Koyama in Madroño 20(5): 254. 1970.

Basionym: *Dichromena ciliata* Vahl, Enum. Pl. 2: 240. 1806; C. B. Clarke in Urban, Symb. Antill. 2(1): 101. 1900.

Type: *Richard*, "America meridionalis," and *West*, Puerto Rico.

Syn.: *Rhynchospora vahliana* Griseb., Fl. Br. W. Ind. Isl. 577. 1864, excl. descr., a renaming of *Dichromena ciliata* Vahl.

Rhynchospora ciliata Vahl var. *vahliana* (Griseb.) C. B. Clarke in Urban, Symb. Antill. 2(1): 101. 1900, excl. descr.

Rhizome abbreviated, not stoloniferous. Leaves radical and 1 or 2 on the culm above; blades 2-4 mm. broad, shorter than to overtopping the culms, the margins ciliate with long hairs; sheaths straw-colored or light brown.

Culms up to 60 cm. tall. Head with 4-10 spikelets. Otherwise as in subsp. *nervosa*.

GENERAL DISTRIBUTION: Same as subsp. *nervosa*.

DISTRIBUTION IN LESSER ANTILLES: Antigua, Montserrat!, Guadeloupe!, Dominica, Martinique!, St. Lucia!, St. Vincent, Barbados, Grenada!.

SCLERIA Bergius

Scleria Bergius in Kongl. Vetensk. Akad. Nya Handl. Stockholm **26**: 142, pls. 4,5. 1765. FIGURE 63.

Spikelets monoecious, or bisexual and staminate in one inflorescence, rarely all bisexual. Pistillate spikelets determinate with a terminal pistillate flower and few to several empty glumes. Staminate spikelets indeterminate with more or less 2-ranked glumes, all or most of them bearing an axillary staminate flower. Bisexual spikelets determinate with a terminal pistillate flower and several glumes, the glume immediately below the pistillate flower bearing a short, secondary, staminate spikelet as a side branch. Pistillate flower consisting of a naked pistil over a hypogynium, developing into globose or ovoid bony achene; hypogynium cuplike or discoid, persistent, falling with the achene. Staminate flowers of 1-3 stamens only.

Large or small perennials, sometimes small annuals. Culms erect, rarely straggling or climbing, many-nodose. Basal leaves reduced to bladeless sheaths; leaves on middle and upper parts of culms with elongated blades; apex of ventral side of leaf-sheath projecting beyond sheath orifice forming a tongue-like appendage (contraligule). Inflorescences mostly paniculate, occasionally glomerate or spiciform.

TYPE SPECIES: *Scleria flagellum-nigrorum* Bergius.

A large tropical genus with over 200 species; some species extend also into subtropical and warm-temperate regions.

KEY TO THE SPECIES

1. Hypogynium cuplike, conspicuous. 2
- 1a. Hypogynium stipelike, obscure. 8
2. Hypogynium narrower than achene; panicles ovoid or pyramidal, subdense, not spiciform. 3
- 2a. Hypogynium broader than achene; panicles elongated, linear to lanceolate in outline, often more or less nodding above. 6
3. Hypogynium without broad marginal brim. 4
- 3a. Hypogynium with broad marginal brim; the brim membranous, almost as wide as the hypogynium-lobes, deeply finely lobed. 4. *S. latifolia*
4. Hypogynium discoid, not conspicuously lobed; climbing lianlike plant with stems up to 10 m. long. 1. *S. secans*
- 4a. Hypogynium 3-lobed with suborbicular lobes; stems erect, 50-300 cm. tall. . . 5
5. Leaf margins prominently scabrous; panicle dense; achenes 2.0-2.7 mm. across. 2. *S. scindens*

- 5a. Leaf margins weakly scabrous; panicle loose; achenes 1.5-2.2 (rarely to 2.5) mm. across. 3. *S. pterota*
 6. Achenes 1.0-1.7 mm. long; leaves 7-15 mm. wide. 5. *S. microcarpa*
 6a. Achenes 2-3 mm. long; leaves 10-30 mm. wide. 7
 7. Achenes 2.0-2.5 mm. long; style-base persistent. 6. *S. mitis*
 7a. Achenes 2.5-3.0 mm. long; style-base eventually deciduous. 7. *S. eggersiana*
 8. Rhizomatous perennial; inflorescence with 3 or 4 distant narrow panicles; achenes 2.00-2.75 mm. long. 8. *S. lithosperma*
 8a. Annual with fibrous roots only; inflorescence a spike bearing 4-15 heads of spikelets; achenes 1.0-1.4 mm. long. 9. *S. hirtella*

1. *Scleria secans* (L.) Urban, Symb. Antill. 2(1): 169. 1900; Core in Brittonia 2(1): 96, pl. 2, f. 10. 1936.

Basionym: *Schoenus secans* L., Syst. Nat. ed. 10. 865. 1759 (excl. syn. Rumphii); Amoen. Acad. 5: 391. 1760.

Lectotype: Sloane, Jam. pl. 77, f. 1. 1696.

Syn.: *Scleria reflexa* H. B. K., Nov. Gen. Sp. 1: 232. 1816; C. B. Clarke in Urban, Symb. Antill. 2(1): 145. 1900. (Type locality: Venezuela.)

Mastigoscleria reflexa (H. B. K.) Nees in Mart., Fl. Brasil. 2(1): 177. 1842.

Scleria flagellum sensu Nees in Flora 11: 303. 1828; Griseb., Fl. Br. W. Ind. Isl. 578. 1864, non Swartz.

Rhizomatous perennial. Culms attaining more than 10 m. in length, branched, spreading and often high-climbing, sharply triquetrous, smooth below and scabrous on angles of upper parts, the internodes mostly clothed with leaf-sheaths. Leaves linear, 10-40 cm. long, 3-6 mm. wide, gradually tapering to acute apex, herbaceous, 3-costate, flattish-plicate, glabrous or occasionally pubescent toward the base, sometimes pilose beneath, prominently scabrous on margins and along costas; sheaths up to 10 cm. long, overlapping; contraligule 5-7 mm. long, membranous, brownish, lacerate at apex. Inflorescences of 1-3 panicles borne on distal parts of branches and culm, spaced, ovoid in outline, 2-7 cm. long, 1-4 cm. wide, the axis densely hispid with long hairs, loosely bearing short branches. Spikelets reflexed. Pistillate glumes ovate to broadly so, acute, herbaceous, glabrous, stramineous-brown to dark purple-black, 5-6 mm. long, the greenish keel often hispid toward base, ending in a mucro or recurved cusp. Achenes ovoid to ovoid-globose, 2.5-4.0 mm. long, white, shiny, smooth, occasionally minutely white-puberulent, blunt at apex; hypogynium discoid, subentire, ca. 2 mm. wide, the margin reflexed, cream-colored.

GENERAL DISTRIBUTION: Tropical America, from Mexico and the West Indies southward to southern Brazil and Bolivia.

DISTRIBUTION IN LESSER ANTILLES: St. Kitts, Montserrat!, Guadeloupe!, Dominica!, Martinique!, St. Lucia!, St. Vincent, Grenada!.

2. *Scleria scindens* Nees [in Linnaea 9: 303. 1834, nomen nudum] ex Kunth, Enum. Pl. 2: 343. 1837; C. B. Clarke in Urban, Symb. Antill. 2(1): 148. 1900; Core in Brittonia 2(1): 101, pl. 2, f. 15. 1936.

Type: "Antillae."

Syn.: *Scleria scaberrima* Böckl., Cyp. Nov. 2: 41. 1890. (Type: *Eggers*, St. Vincent.)

Plants growing in large colonies with thick, lignescent rhizomes. Culms 60-300 cm. tall, erect to straggling, rigid, sharply triquetrous, retrorsely scabrous on upper angles. Leaves spaced, broadly linear, 30-80 cm. long, 5-15 mm. wide, acuminate, flattish, 3-costate, subrigid, strongly retrorsely scabrous on margins and costas, especially on midvein beneath; sheaths much shorter than the internode, usually minutely pilose, often stained reddish-purple toward the base, narrowly winged, prominently scabrous on angles. Panicles usually solitary and terminal, occasionally bearing 1 or 2 smaller lateral ones, dense, pyramidal; terminal panicle 5-12 cm. long, the branches patent, 1-5 cm. long, bearing spikelets from very base; leafy bracts at base of terminal panicle 2 or 3, much surpassing the panicle; bracteoles setaceous, 5-8 mm. long. Staminate and pistillate spikelets intermingled, greenish. Pistillate glumes ovate-orbicular, those subtending the achene 3-4 mm. long, abruptly contracted to mucronate apex, thickly herbaceous, greenish, ciliate-margined. Achenes globose to depressed-globose, 2.0-2.7 mm. in diameter, rounded to the usually minutely apiculate apex, white, smooth, shiny; hypogynium 3-lobed, the lobes semicircular, spreading, ca. 1.5 mm. long, rounded.

GENERAL DISTRIBUTION: Endemic to the West Indies.

DISTRIBUTION IN LESSER ANTILLES: St. Kitts!, Guadeloupe!, Dominica!, Martinique!, St. Lucia, St. Vincent!.

3. *Scleria pterota* Presl in Oken Isis 21: 268. 1826; C. B. Clarke in Urban, Symb. Antill. 2(1): 146. 1900; Core in Brittonia 2(1): 91, pl. 2, f. 18. 1936.

Type locality: Puerto Rico.

Syn.: *Scleria melaleuca* Reichenb. ex Schlecht. & Chamisso in Linnaea 6: 29. 1831; Griseb., Fl. Br. W. Ind. Isl. 578. 1864; Core in Brittonia 2(1): 89, pl. 2, f. 25. 1936. (Type: *Weigelt*, Surinam.)

Scleria pratensis Lindley ex Nees in Mart., Fl. Brasil. 2(1): 179. 1842; Nov. Act. Acad. Caes. Leop.-Carol. Nat. Curios. 19(Suppl. 1): 121. 1843; Griseb., Fl. Br. W. Ind. Isl. 577. 1900, nomen illeg.

Rhizome creeping, ligneous, 4-7 mm. thick, clothed with purple-fuscescent scales. Culms solitary or 2 or 3 together, 50-100 cm. tall, acutely triquetrous, scabrid on angles. Basal sheaths bladeless or short-bladed, 2-14 cm. long, dark purple or purple-brown. Leaves cauline, distantly distributed; blades broadly linear, 15-40 cm. long, 7-15 mm. wide, herbaceous, 3-costate, glabrous, scabrous on margins, subabruptly narrowed to a somewhat obtuse or acute apex; sheaths 8-13 cm. long, narrowly 3-winged, the contraligule deltoid, 3-9 mm. long, pilose on reddish-brown cartilaginous margin. Panicles 3 or 4, pyramidal, 5-15 cm. high, loosely flowered, the rachis and branches puberulent or glabrescent, often purplish; bracts of lateral panicles leaflike, equaling or slightly surpassing the terminal panicle; bractlets

setaceous. Staminate and pistillate spikelets intermingled, greenish-brown to deep purple. Pistillate glumes ovate-orbicular, 2.5-3.5 mm. long, herbaceous, 1-costate, acuminate at often recurved apex, minutely ciliate on margins. Achenes depressed, obovoid-globose, 1.5-2.2(-2.5) mm. long and as broad, bony, purplish to pinkish, whitish or tinged with yellow-brown; hypogynium 3-lobed, the lobes rounded, ciliate or glabrous; stigmas 3.

GENERAL DISTRIBUTION: Tropical America from the West Indies south to northern Argentina.

DISTRIBUTION IN LESSER ANTILLES: Saba!, St. Kitts!, Antigua!, Montserrat!, Nevis!, Guadeloupe!, Dominica!, Martinique!, St. Lucia!, St. Vincent!, Barbados!, Grenada!.

Scleria pterota and *S. melaleuca* have generally been treated as specifically distinct. I have made a detailed comparison between the two and find the only difference to be in the color of achenes, which is whitish to cream-colored in the former in contrast to purple in the latter. I, however, have noted achenes showing a series of intermediate colors such as light purple or pink which invalidates the above separation. I doubt very much if *S. melaleuca* could be held even at a subspecific level.

4. *Scleria latifolia* Swartz, Prodr. 18. 1788, Fl. Ind. Occid. 1: 95. 1797; Griseb., Fl. Br. W. Ind. Isl. 578. 1864; C. B. Clarke in Urban, Symb. Antill. 2(1): 151. 1900; Core in Brittonia 2(1): 55, pl. 1, f. 26. 1936.

Type: Swartz, Jamaica.

Syn.: *Scleria nervosa* Wikstr., Öfversigt Guadel. Fl. 75. 1828. (Type locality: Forss-trom, Guadeloupe.)

Scleria arundinacea Kunth, Enum. Pl. 2: 347. 1837; C. B. Clarke in Urban, Symb. Antill. 2(1): 152. 1900; Core in Brittonia 2(1): 53, pl. 1, f. 11. 1936.

(Type locality: Cited as "Nova Hollandia," apparently by error. Core (1936) assumes that the type is possibly from Martinique.)

Schizolepis latifolia (Swartz) Nees in Mart., Fl. Brasil. 2(1): 186. 1842.

Herb, loosely tufted with short, thick, woody rhizomes. Culms erect, 30-200 cm. tall, 3-8 mm. wide below, sharply triquetrous with more or less concave sides, smooth below and scabrous on upper angles. Leaves spaced, lanceolate, 20-50 cm. long, 2-5 cm. wide, flattish-plicate with 3-7 nerves, herbaceous, subabruptly narrowed to acuminate apex, scabrous on margins only; sheaths 7-20 cm. long, 3-winged, frequently more or less stained with red-purple below. Inflorescence with 2 or 3 panicles; panicles pyramidal, subdense, 5-10 cm. long, 3-10 cm. wide, with many patent branches up to 7 cm. long; bracts of lateral panicle(s) leaflike, much surpassing the subtending panicle and nearly equaling the terminal panicle; bracteoles setaceous. Pistillate and staminate spikelets intermingled. Pistillate glumes broadly ovate, boat-shaped, subabruptly narrowed to cuspidate apex, thinly herbaceous with broad membranous margins, pale brownish to dark purple, with scattered short pubescence, the keel green or purple, hispidulous, the two subtending glumes longer than the achene, 3-4 mm. long. Achenes

depressed-globose, 2.5–3.0 mm. long, 3.0–3.5 mm. wide, rounded, white or purple, smooth; hypogynium 3-lobed, the lobes rounded, 0.5–0.7 mm. long, straw-colored, with membranous, irregularly finely lobed brim ca. 0.5 mm. wide, the brim pale brownish to deep purple.

GENERAL DISTRIBUTION: Tropical America, from Guatemala and the Lesser Antilles south to northern Argentina.

DISTRIBUTION IN LESSER ANTILLES: St. Kitts!, Nevis!, Montserrat!, Guadeloupe!, Dominica!, Martinique!, St. Lucia!, St. Vincent!, Grenada!.

As was assumed by Core(1936), *S. arundinacea* does not differ from *S. latifolia* except for the purple color of inflorescence axis, branches and floral glumes. It is often noted that plants with brownish inflorescence (*S. latifolia* sensu stricto) bear purple achenes mixed with white ones and leaf sheaths that are stained with red-purple in varying degrees. Both species are found in the undergrowth of tropical forests and have the same range of distribution. I regard *Scleria arundinacea* as no more than a color form of *S. latifolia*, and consequently relegate the binomial to the synonymy of *S. latifolia*.

5. *Scleria microcarpa* Nees [in Linnaea 9: 302. 1834, nomen nudum] ex Kunth, Enum. Pl. 2: 341. 1837; Griseb., Fl. Br. W. Ind. Isl. 578. 1864, pro maiore parte; C. B. Clarke in Urban, Symb. Antill. 2(1): 149. 1900; Core in Brittonia 2(1): 38. 1936.

Type localities: Surinam and Martinique.

Syn.: *Ophryoscleria microcarpa* (Nees ex Kunth) Nees in Mart., Fl. Brasil. 2(1): 184. 1842.

Plants loosely tufted with horizontally decumbent woody rhizome. Culms 50–180 cm. tall, 2–5 mm. thick below, triquetrous, erect with often more or less nodding inflorescences. Leaves spaced, the basal few subaphyllous, the upper ones with relatively short linear blades, 10–30 cm. long, 7–15 mm. wide, herbaceous, rather soft, smooth except for weakly scabrous margins; sheaths broadly 3-winged, green. Inflorescence with 3–5 more or less spiciform panicles; panicles distant, erect to nodding, slender, 6–12 cm. long, distantly bearing short branches 2–10 mm. long, each bearing 3–several spikelets; bracteoles setaceous; bracts of lateral panicles leaflike, surpassing the subtending panicle, long-sheathing at base. Staminate and pistillate spikelets intermingled and clustered. Pistillate spikelets weakly flattened with 2-ranked glumes; glumes patent, broadly ovate, boat-shaped, acute, those subtending the achene 1.2–1.7 mm. long, membranous, straw-colored with 1-nerved, green keel. Achenes ovoid-ellipsoid, weakly flattened, 1.0–1.7 mm. long, smooth, white to cream-colored, weakly shiny, the tubercle-shaped style-base almost persistent; hypogynium cuplike, 0.5–0.7 mm. high, broader than the achene, the margin more or less entire, white-ciliate.

GENERAL DISTRIBUTION: From Cuba and Guatemala south to Paraguay.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe, Marie Galante!, Dominica, Martinique.

This species is rather rare in the Lesser Antilles, though it is quite common in South America. It differs from *S. mitis* in the smaller achenes and more slender panicles and leaves.

6. *Scleria mitis* Bergius in Kongl. Vetensk. Acad. Nya Handl. Stockholm 26: 145, t. 5. 1765; C. B. Clarke in Urban, Symb. Antill. 2(1): 150. 1900; Core in Brittonia 2(1): 40, pl. 1, f. 22. 1936.

Type locality: Surinam.

Syn.: *Ophryoscleria mitis* (Berg.) Nees in Mart., Fl. Brasil. 2(1): 185. 1842.

Herb subloosely tufted with thick, lignescent rhizome. Culms 90–300 cm. tall, 4–7 mm. thick below, triquetrous, rigid, smooth. Leaves spaced, broadly linear, 10–30 mm. wide, 30–80 cm. long, herbaceous, flattish-plate, acute, scabrid on upper surface and along margins; sheaths broadly 3-winged, the contraligule lanceolate, up to 3 cm. long. Panicles 3–5, narrow; terminal panicle up to 30 cm. long, the lower few branches patent, up to 7 cm. long, the upper branches short, 5–17 mm. long; lateral panicles more slender than the terminal one, subtended by a leafy bract; lower bracts much surpassing the panicle, the upper bracts equaling to slightly longer than the panicle. Spikelets solitary or in clusters of 2–4, loosely more or less spicately disposed on panicle branches, the pistillate and the staminate ones intermingled. Pistillate glumes 2-ranked, patent, ovate-orbicular, boat-shaped, abruptly contracted to acuminate apex, herbaceous, straw-colored and variegated with red-brown, ciliolate on margins, the keel 1-nerved, greenish, the two glumes subtending the achene 2.5–3.5 mm. long. Achenes ellipsoidal, 2.0–2.5 mm. long, smooth, whitish or olive-colored to deep greyish, weakly shiny, the round apex crowned by a conical, dark purple style-base ca. 1 mm. long; hypogynium cuplike, ca. 1.5 mm. high, wider than the achene, the margin densely ciliate with brown or purple-brown hairs.

GENERAL DISTRIBUTION: Tropical America from Cuba and Guatemala south to Paraguay and southern Brazil.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe!, Martinique!, St. Lucia!, St. Vincent!.

7. *Scleria eggersiana* Böckl., Cyp. Nov. 2: 41. 1890; Core in Brittonia 2(1): 42, pl. 3, f. 32. 1936.

Type: Eggers, Cuba.

Syn.: *Scleria grisebachii* C. B. Clarke in Urban, Symb. Antill. 2(1): 150. 1900.

Many collections from the West Indies cited.

Scleria mitis sensu Griseb., Fl. Br. W. Ind. Isl. 578. 1864, non Bergius.

Scleria microcarpa Griseb., Fl. Br. W. Ind. Isl. 578. 1864, pro parte.

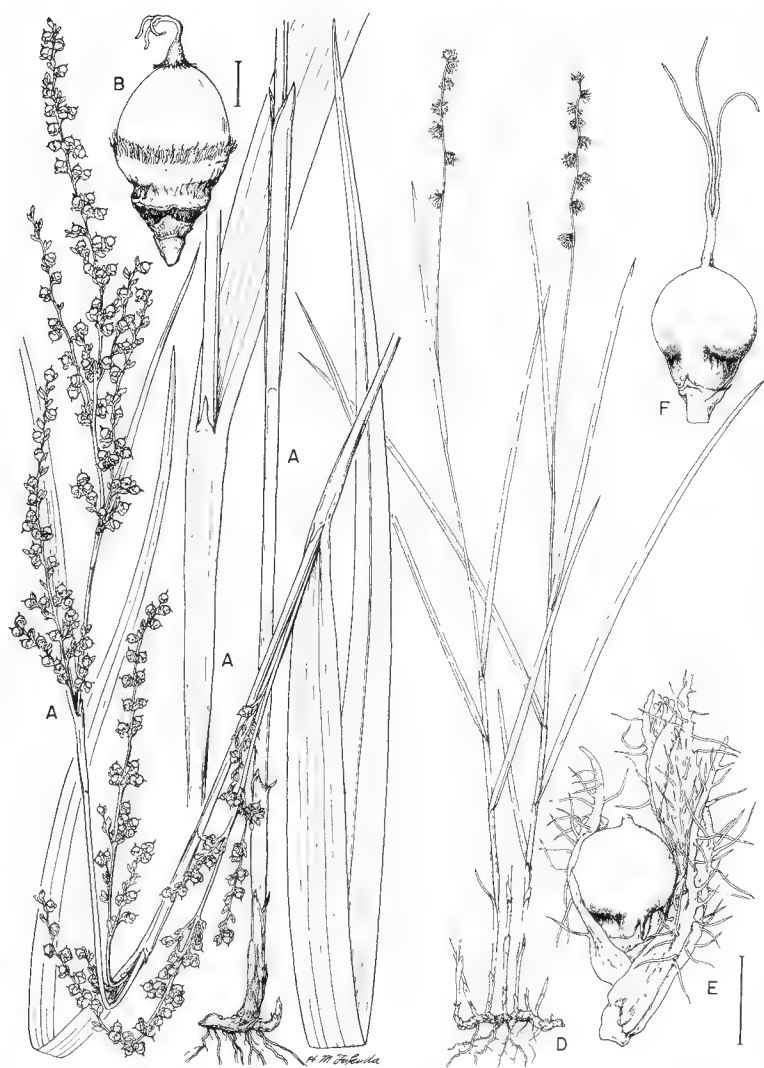


FIGURE 63. Cyperaceae. a-f, *Scleria*. a, b, *S. mitis*: a, habit; b, achene. d-f, *S. nutans*: d, habit; e, spikelet; f, achene. Bar scales (for floral parts) = 1 mm.

Herb loosely tufted with short, horizontal, lignescent rhizomes. Culms erect, 100-180 cm. tall, 6-9 mm. thick below, triquetrous, smooth. Leaves spaced, broadly linear, 25-50 cm. long, 15-25 mm. wide, coriaceous, flat-tish-plicate, scabrid on margins and along midvein on lower surface; sheaths 10-13 cm. long, 3-winged, scabrous on wing edges; contraligules deltoid-lanceolate, 1.0-2.5 cm. long. Inflorescence narrow, 25-40 cm. long, bearing 3-5 panicles; panicles solitary or binate, more or less spiciform, bearing short branches 0.5-1.5 cm. long; bracts of lateral panicles leaflike, surpassing the subtending panicle; bracteoles setaceous, 5-10 mm. long. Pistillate and staminate spikelets intermingled. Pistillate glumes ovate-orbicular, suddenly contracted to mucronate apex, boat-shaped, chartaceous, straw-brown and stained or variegated with deep red-brown, the keel 1-nerved, greenish, the two subtending glumes 2-3 mm. long. Achenes nearly globose or broadly ellipsoid, 2.5-3.0 mm. long, smooth, shiny, white to light purplish-grey, crowned with eventually falling, brown, subulate style-base 0.5-0.7 mm. long; hypogynium cuplike, 1.5-1.8 mm. deep, the shallowly 3-lobed to nearly entire margin densely ciliate with yellow-brown hairs.

GENERAL DISTRIBUTION: The West Indies, Guatemala and Panama, also once recorded from Surinam.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe, Marie Galante!, Dominica, Martinique!, Grenada!.

8. *Scleria lithosperma* (L.) Sw., Prodr. 18. 1788; C. B. Clarke in Urban, Symb. Antill. 2(1): 141. 1900; Core in Brittonia 2(1): 27. 1936.

Basionym: *Scirpus lithospermus* L., Sp. Pl. 1: 51. 1753.

Type locality: "India."

Syn.: *Scleria filiformis* Swartz, Prodr. 19. 1788; Griseb., Fl. Br. W. Ind. Isl. 579. 1864. (Type locality: West Indies.)

Hypoporum lithospermum (L.) Nees in Mart., Fl. Brasil. 2(1): 172. 1842.

Slender perennial. Culms loosely tufted from short, knotty rhizome, erect, 40-80 cm. tall, 1-2 mm. thick below, 3-sided, smooth, glabrous. Leaves equally distributed or somewhat dense at the mid-portion of culms; leaf blades narrowly linear, 1.5-4.0 mm. wide, 8-40 cm. long, rigid, canaliculate, 3-costate, gradually narrowed to the somewhat obtuse apex, revolute on scabrous margins, deeply green and glaucescent when dried; sheaths 3-sided, 6-9 cm. long, brownish-red, not winged, pubescent, the basal ones bladeless, reddish-purple; contraligule depressed-rounded or depressed-deltoid, 1-2 mm. long, ciliate. Inflorescence consisting of 3 or 4 distantly borne, very loose, narrow panicles, 20-35 cm. long, 2-3 cm. wide, sometimes becoming almost spiciform, the lateral panicles single; peduncles capillary, enclosed in bract sheath; branches short, ascending, capillary; leaflike bracts much longer than inflorescence. Spikelets bisexual, solitary or 2 or 3 together, 3-5 mm. long, ovate-turbinate; glumes subtending achene ovate, 3-4 mm. long, rusty-brown, acuminate or acute and mucronate at apex, 1-

nerved; glume immediately below the fruiting structure bearing an axillary staminate spikelet which is about as long as the subtending glume, sessile, with a few staminate glumes; stamens 1, occasionally 2. Achene obovoid or obovoid-ellipsoid, 2.00–2.75 mm. long, 1.75–2.00 mm. wide, obtusely trigonous, rounded at apex, smooth, shining white, minutely umbonulate, the base cuneate with three depressions; hypogynium obsolete, reduced to a small annule completely adnate to achene base.

GENERAL DISTRIBUTION: Pantropic.

DISTRIBUTION IN LESSER ANTILLES: Anguilla!, St. Barts!, Guadeloupe, Marie Galante!, La Désirade!, Dominica!, Martinique!, St. Lucia!, Bequia, Grenada.

9. *Scleria hirtella* Swartz, Prodr. 19. 1788, Fl. Ind. Occid. 1: 93. 1797; Griseb., Fl. Br. W. Ind. Isl. 579. 1864; C. B. Clarke in Urban, Symb. Antill. 2(1): 140. 1900.

Type: *Swartz*, Jamaica.

Syn.: *Scleria distans* Poir. in Lam., Encycl. Méth. Bot. 7: 4. 1806; Core in Brittonia 2(1): 12, pl. 3, f. 31. 1936. (Type: *Desfontaines*, Puerto Rico.)

Hypoporum hirtellum (Sw.) Nees in Linnaea 9: 303. 1834.

Annual, tufted with purplish-red roots. Culms slender, 10–50 cm. tall, ca. 1 mm. thick below, simple, acutely triquetrous, glabrous. Leaves few, spaced, narrowly linear, 10–18 cm. long, 1.5–3.0 mm. wide, shorter than culms, 3-costate, herbaceous, glabrous or pilose; sheaths with acute edges but not winged, the basal bladeless sheaths purplish-red; contraligule deltoid. Inflorescence spiciform, 4–17 cm. long, bearing 4–15 headlike clusters of spikelets; leafy bracts absent. Clusters of spikelets 4–6 mm. long, bearing 4–7 spikelets; bracts setaceous, 4–7 mm. long. Spikelets bisexual, 3–4 mm. long; glumes ovate, 1.5–2.5 mm. long excluding awn, membranous, straw-colored to red-purple, the prominent costa projecting beyond the glume apex forming a straight awn 1–3 mm. long. Staminate flowers located on part of 1 spikelet only. Achenes globose to depressed-globose, 1.0–1.4 mm. long, rounded to mucronate at apex, glabrous, shining white, smooth or with 3–20 scattered tubercles; hypogynium stipelike, porose below achene base, brownish.

GENERAL DISTRIBUTION: The West Indies to Brazil, tropical Africa and Madagascar.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe!.

This species, known in the West Indies only from Puerto Rico and Cuba, is documented from Guadeloupe only by two collections, *Duss 3109* and *3736*.

DIPLACRUM R. Brown

Diplacrum R. Brown, Prodr. Fl. Nov. Holl. 241. 1810.

FIGURE 64.

Pteroscleria Nees in Mart., Fl. Brasil. 2(1): 196. 1842.

Spikelets as a rule bisexual, rarely becoming pistillate through the abortion of second-order staminate spikelets, determinate with a terminal pistillate flower and 2-4 glumes. Distal two glumes much larger than the lower ones, tightly enveloping the achene and falling with it; lower glumes empty, usually subtending a second-order staminate spikelet, occasionally much-reduced and disappearing especially when the second-order staminate spikelet is abortive. Pistillate flower composed of a naked pistil over a small discoid hypogynium, developing a globose to subtrigynous bony achene; stigmas 3. Staminate flowers of 1-3 stamens.

Small or medium-sized perennials or annuals; slender stolons sometimes present. Culms few- to several-nodose, bearing heads of spikelets from above the base, leaved at base. Leaves radical and subradical, with elongate blade. Inflorescences of sessile or peduncled axillary heads subtended by a leafy bract.

TYPE SPECIES: *Diplacrum caricinum* R. Brown.

Seven species in tropical and subtropical regions of both hemispheres. Two American species occur in the West Indies, Guyana, Amazonia and the northern Andean region, with a single species present in the Lesser Antilles.

1. *Diplacrum longifolium* (Griseb.) C. B. Clarke ex Dur. & Schinz, Consp. Fl. Afr. 5: 669. 1894.

Basionym: *Pteroscleria longifolia* Griseb., Fl. Br. W. Ind. Isl. 579. 1864.

Type: Lockhart, from Trinidad (K).

Syn.: *Scleria amphigaea* Raymond in Nat. Can. 91: 132. 1964. A new name for *Pteroscleria longifolia* Griseb.

Perennial, not tufted; stolons slender, long-creeping, up to 20 cm. long, covered with brownish scales. Culms leaved at base, 15-60 cm. tall, 1-3 mm. thick, triquetrous, smooth, 2- to 5-nodose, bearing heads from above the base. Leaves rather many, obscurely 2-ranked; blades linear, 15-50 cm. long, 2-7 mm. wide, the upper ones overtopping the culm, herbaceous, light green, smooth except on scabrid upper margins, subabruptly narrowed to subobtuse apex, the sheathing base 1-6 cm. long, reddish-purple, ventrally membranous and marcescent, the orifice without contraligule. Inflorescence bearing 2-5 heads, all spaced or the uppermost two approximate; heads globose to somewhat depressed-globose, occasionally more or less lobed, 1.0-1.8 cm. by 1-2 cm., densely bearing numerous spikelets, subtended by 1-3 setaceous bracteoles, the terminal head sessile, the lateral ones on enclosed or short-exserted erect peduncle; leafy bracts linear, 3-25 cm. long, sheathing at base. Spikelets bisexual or pistillate through the abortion of their second-order staminate spikelets, determinate with a terminal pistil; bisexual spikelets bearing 3 or 4 glumes; the distal two glumes much larger than the lower one(s), ovate, strongly folded with an acute, winglike keel, 3.50-4.75 mm. long, membranous, pale, mucronate at apex; lower 1

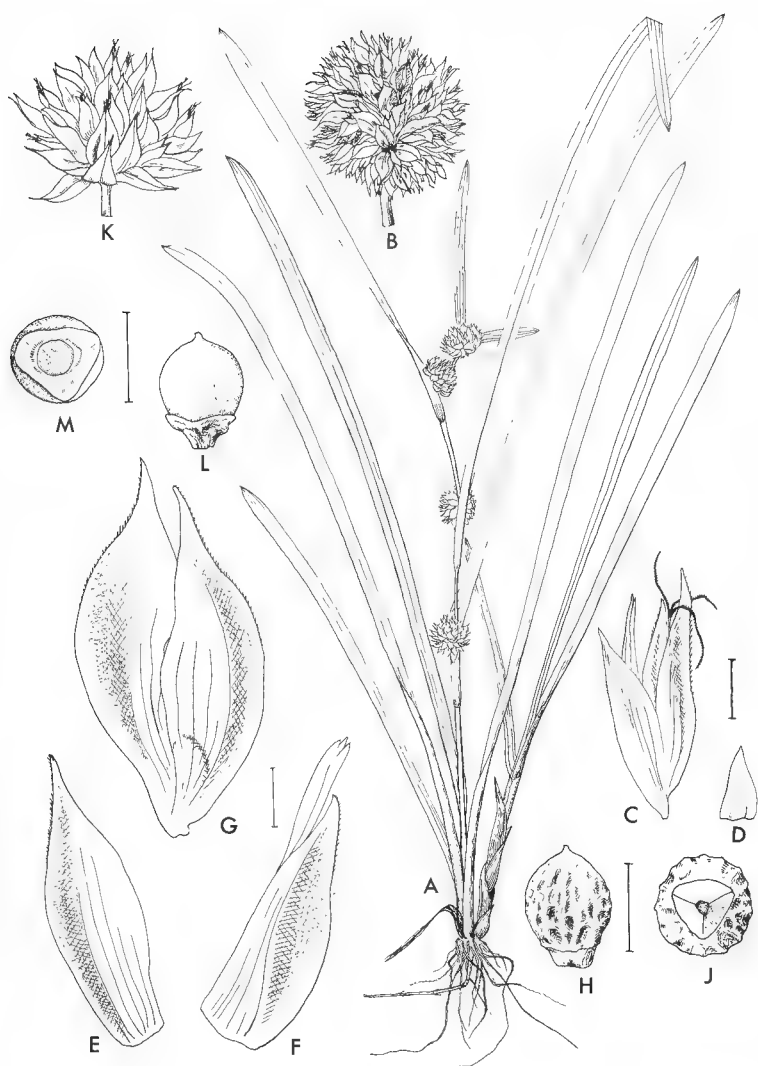


FIGURE 64. Cyperaceae. a-i, *Diplacrum longifolium*: a, habit; b, head; c, spikelet in flower; d, prophyll; e, first glume of a sterile spikelet; f, second glume subtending a second-order staminate spikelet; g, two glumes below achene; h, i, lateral and bottom views of mature achene with its hypogynium. k-m, *Diplacrum capitatum*, showing head and achene for comparison. Bar scales (for floral parts) = 1 mm.

or 2 glumes 2.7-3.0 mm. long, subtending a lateral, small, second-order staminate spikelet. Achene tightly enveloped by two distal glumes and falling with them, the body nearly globose, 1 mm. long, 0.8 mm. wide, rounded to mucronulate apex, white, bony, longitudinally several-ridged or partially more or less reticulate; hypogynous disc 0.3-0.5 mm. high, the margin entire or obscurely trilobate. Stigmas 3, 3 mm. long.

GENERAL DISTRIBUTION: Disjunctively occurring in tropical America and tropical West Africa. The range in tropical America extends from Bolivia through Colombia and Brazilian Amazonia northeast to French Guiana and West Indies up to Jamaica, while the range in tropical West Africa covers Liberia and Upper Guinea.

DISTRIBUTION IN LESSER ANTILLES: Dominica!

The occurrence of this species in the Lesser Antilles is recorded by a single collection, *Webster 13391* (GH, US) from St. Paul, Dominica.

CAREX Linnaeus

Carex L., Sp. Pl. 2: 972. 1753.

Monoecious (except in few boreal species, which are or tend to be dioecious). Spikelets reduced to a single flower. Staminate spikelets consisting of single, triandrous, naked staminate flowers borne in the axils of staminate glumes. Pistillate spikelets consisting of a single naked pistil contained in a bottle-shaped prophyll (utricule); utricles completely closed at sides, the apex only with an orifice through which the divided portion (stigmas) of the style is exposed, 2-costate, nerved or nerveless, the dilated lower part (body) attenuated or contracted above to the beaked or non-beaked apex, each utricule subtended by a pistillate glume. Fruit an achene, 3-sided with 3 stigmas or lenticular with 2 stigmas.

Perennials, often with ligneous rhizomes. Leaves 3-ranked, radical and/or cauline, with linear or rarely lanceolate blades, the bases forming closed sheaths; radical sheaths often brown, red-brown, purple-brown, or dusky-brown, frequently disintegrating into fibers and covering the neck of rhizome. Inflorescence racemose, spicate, fasciculate, or paniculate, with 2-many spikes, or of a single terminal spike, the lateral spikes bracteate. Spikes bisexual or unisexual, in the latter case normally the terminal one staminate and the lateral ones pistillate; glumes spirally disposed on a simple axis of spikes, close, the staminate glumes bearing an axillary staminate flower, the pistillate glumes bearing a utricule at the axil.

TYPE SPECIES: *Carex acuta* L.

The largest genus in the family with about 2,000 species, distributed throughout the world under all ecological conditions. A single species is found in the Lesser Antilles.

1. *Carex polystachya* Swartz ex Wahlenb. in Kongl. Vetensk. Acad. Nya Handl. 24: 149. 1803; Kükenthal in Das Pflanzenr. IV, 20(Heft 38): 267.

Type: Swartz, Jamaica.

Syn.: *Carex dussiana* Böckl., Cyp. Nov. 2: 42. 1890. (Type: Duss 763b, Martinique.)

Carex cladostachya sensu Griseb., Fl. Br. W. Ind. Isl. 580. 1864; C. B. Clarke in Urban, Symb. Antill. 2(1): 157. 1900, non Wahlb.

Carex cladostachya Wahlb. forma *polystachya* (Swartz ex Wahlb.) C. B. Clarke ex Lindm. in Bih. Kongl. Svenska Vetensk.-Akad. Handl. 26, III(9): 36. 1900.

Tufted herb, with short woody rhizome. Culms 25–60 cm. tall, trigonous, distantly 1- or 2-nodose above the leafy base. Leaves radical and subradical with 1 or 2 cauline above, narrowly linear, 2–7 mm. wide, up to 60 cm. long, stiff, flattish-plicate, long-sheathing at base; basal sheaths pale-stramineous, disintegrating into brown fibers. Inflorescence a compound panicle, up to 30 cm. long with 4–10 secondary panicles at 3 or 4 nodes; secondary panicles single or binate, 2–6 cm. long, subpyramidal on long-exserted peduncle; leafy bracts long-sheathing, the blades elongated, much longer than the subtending secondary panicle and mostly slightly overtopping the whole inflorescence. Spikes androgynous, ovate to ovate-oblong, 5–10 mm. long, the pistillate and the staminate parts nearly equal in length, the pistillate part ca. 4 mm. thick; bracteole awned. Pistillate glumes ovate, 1.0–1.2 mm. long, straw-colored to red-brown, the margins hyaline; midvein greenish, excurrent beyond the apex of the glume into a somewhat straight awn. Utricles obovate-fusiform, 3.0–3.5 mm. long, trigonous, 2-keeled, membranous, green, glabrous, the somewhat straight to slightly recurved beak ca. 1 mm. long, 2-toothed. Achenes elliptic, 3-sided, 1.5–2.0 mm. long, tightly enveloped; style 2.5 mm. long, spongy at base, 3-cleft above for $\frac{1}{2}$ its length.

GENERAL DISTRIBUTION: From Mexico and the West Indies south to Peru.

DISTRIBUTION IN LESSER ANTILLES: St. Kitts!, Martinique.

PALMAE

by R. W. Read³

PALMAE Jussieu, Gen. Pl. 37. 1789 (*nom. alt.*: ARECACEAE C. H. Schultz., Nat. Syst. Pflanzenr. 317. 1832).

Trees, shrubs, undershrubs or vines with very thick or fine fibrous roots, perennial, sometimes monocarpic. Stems slender to massive, strongly fibrous, solitary, tufted or soboliferous, rarely branched, ringed with leaf-scars and smooth waxy internodes or rough with persistent petiole-base fibers or fissured. Leaves spirally arranged, with sheathing, tubular, armed

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or unarmed, deciduous or persistent petioles; blade plicate in vernation, simple and linear-elliptic to orbicular with crenate, serrate or entire margins and pinnate or palmate venation, or pinnately or rarely bipinnately compound, or palmately or costapalmately divided; leaflets and segments induplicate or reduplicate in vernation, linear-elliptic, falcate, sigmoid or cuneiform, glabrous or scaly, hairy, prickly or waxy at least during development; stipules absent. Flowers bisexual or unisexual and the plants monoecious, dioecious or polygamous, actinomorphic, in terminal or axillary, infra-, inter- or suprafoliar, bracteate, sessile or pedunculate panicles, spikes or heads, individually pedicellate or sessile, solitary or clustered in triads of 2 staminate on either side of one pistillate flower or in acervuli of lines of flowers with one to several pistillate flowers and several to many staminate flowers, rarely with paired pistillate flowers in what would otherwise be expected to be normal triads. Perianth biseriate (or in *Thrinax* and allies a single usually irregularly 6-lobed series); sepals usually 3, imbricate or rarely valvate, free or connate; petals usually 3, imbricate or valvate, often shortly connate, rarely adnate to sepals; sepals and petals persistent in fruit. Stamens 3 to 200 or more; filaments free, connate or epipetalous; anthers (1- or) 2-locular, opening lengthwise. Unisexual flowers usually with pistillodes or staminodes respectively. Ovary superior, of 3 or rarely more uniovulate carpels, unicarpellate in *Thrinax* and allies; carpels free or variously united; ovules generally anatropous; styles as many as carpels, free or fused or stigmas sessile. Fruit small to very large, 1-3 (rarely more)-seeded, dry and fibrous or baccate, with smooth, scaly, prickly, hairy or warty exocarp, fibrous or fleshy mesocarp and papery to bony endocarp. Seed with solid, hollow, perforated, homogeneous or ruminate endosperm and a subapical, lateral or basal embryo.

TYPE GENUS: *Areca* Linnaeus.

About 212 genera with 2600 species, distributed in nearly all tropical and subtropical regions and extending to some warm-temperate areas.

KEY TO THE INDIGENOUS AND COMMONLY NATURALIZED GENERA OF PALMS

1. Leaves palmate (or costapalmate with a prominent central rib continuous with the petiole, running through the blade). 2
- 1a. Leaves pinnate. 4
2. Leaves costapalmate, the costa or midrib continuous with the petiole, extending through the length of the blade and strongly recurved; inflorescence large and greatly branched (Antigua?). *Sabal*
- 2a. Leaves palmate, lacking a prominent costa; inflorescence slender, subdivided into 5-15 separate, pendent, primary branches arising from an erect or arching rachis. 3
3. Leaf sheath split below the insertion of the petiole; fruit white, mealy; seed smooth, semiperforated on one side. *Thrinax*
- 3a. Leaf sheath not split below the insertion of the petiole, the tubular portion persistent and having the appearance of a finely woven net; fruit purple-black, juicy; seed cerebriform, separating into several divisions when dry. *Coccothrinax*

4. Plants armed either with needlelike prickles, marginal teeth on the leaf segments, spinelike lower leaf segments, or a whiplike extension of the leaf rachis. 5
- 4a. Plants unarmed. 9
5. Leaf rachis extended, whiplike, with 2-several pairs of large, retrorse climbing hooks; stems scandent. *Desmoncus*
- 5a. Leaf rachis not extended as a climbing organ; plants self-supporting. 6
6. Petiole, sheath, and leaf rachis with scattered needlelike prickles; fruit not covered by large, shiny, brown, overlapping scales. 7
- 6a. Petiole, sheath, and leaf rachis lacking needlelike prickles. 8
7. Leaf segments with the apices broad and erose (irregularly cut), often with an extended fingerlike projection; fruit red or scarlet. *Aiphanes*
- 7a. Leaf segments with the apices narrow and pointed or bifid, not erose or premorse; fruit not red or scarlet. *Acrocomia*
8. Lowermost leaf segments very stiff, sharp-pointed and spinelike; elsewhere the plicate segments induplicate (with the principal nerve lowermost, the margins folded upward); fruit a smooth, yellow or orange drupe. *Phoenix*
- 8a. Leaf segment margins and upper ridge of the rachis with scattered, sharp teeth, the plicate segments reduplicate, folded downward; fruit covered with large, shiny, brown, overlapping scales. *Raphia*
9. Caudex banded with waxy, glaucous, gray-green bands; inflorescence twice to three times branched; fruit red, 1-3-lobed and -seeded; flowers all alike, bisexual. *Pseudophoenix*
- 9a. Caudex often variously ringed with leaf scars but not banded with waxy, glaucous, gray-green bands; inflorescence once-branched; fruit always single lobed and 1-seeded, never red; flowers dimorphic, unisexual. 10
10. Larger inflorescence bract (spathe) woody, persistent, often longitudinally plicate or grooved; fruit greater than 3 cm. in length, greenish to orange at maturity; nut (endocarp) bony, hard, with 3 distinct pores. 11
- 10a. Larger inflorescence bracts leathery or papery but not woody, caducous or deciduous, not plicate or grooved; fruit less than 2 cm. in diameter, purple to black, never orange; nutlet (endocarp) thin, lacking pores or at best only one present. 12
11. Leaf segments clustered, somewhat multifarious; fruit ca. 3 cm. in diameter, not more than 6 cm. long; nut ca. 2 cm. in diameter. *Rhyticocos*
- 11a. Leaf segments regularly inserted in a single plane; fruit ca. 20-30 cm. in diameter, not less than 20 cm. in length; nut ca. 10-15 cm. in diameter. *Cocos*
12. Trunks always solitary, not less than 8 cm. in diameter; leaf segments all alike, straight to arching, with a single major adaxial nerve; not all flowers immersed in branch pits; anther cells continuous with a common connective. 13
- 12a. Trunks solitary or clustered, less than 5 cm. in diameter; leaves irregularly divided, segments varying in width, inserted along a broad base, usually with several equally prominent nerves; flowers all completely immersed in the branch pits; anther cells distinct on bifid connectives. *Geonoma*
13. Fruit spherical to globose; stigmatic remains apical to subapical; when crownshaft is evident the leaf segments quite pendulous; primary bract not filled with loose scales; seedling leaves pinnate or bifid. 14
- 13a. Fruit pyriform or obovate; stigmatic remains basal to subbasal; plants massive with a huge green crownshaft and the leaf segments not pendent; primary

- bracts filled with loose farinaceous scales among the inflorescence branches; seedling leaves lanceolate. *Roystonea*
14. Crownshaft conspicuous; leaf segments quite pendulous; inflorescence branches densely pubescent; flowers set in shallow pits which appear deep because of the pubescence; staminate flowers with stamen filaments straight in bud; seedling leaves pinnate. *Euterpe*
- 14a. Crownshaft obscure or split opposite the petiole; inflorescence branches glabrescent; flowers superficially inserted; staminate flowers with stamen filaments inflexed in bud; seedling leaves bifid. *Prestoea*

SABAL Adanson

Sabal Adanson, Fam. Pl. 2: 495, 599. 1763; Bailey in Gent. Herb. 3: 274-293, 296-298. 1934, 6: 382-386. 1944.

Small, medium or large, solitary, caulescent or acaulescent, unarmed, costapalmate-leaved palms. Caudex usually heavy, rarely slender, usually rough-fibrous, covered with persistent split leaf bases, or rarely leaf bases deciduous and caudex clean, but with prominent leaf scars. Leaf sheath fibrous, rapidly disintegrating; petiole elongate, conspicuous, rounded abaxially, channeled adaxially, usually with sharp margins, split in the base of the sheath portion; blade flabellate, with a strong costa running through the blade, continuous with the petiole and usually strongly recurved, rarely the costa quite short; segments bifid apically, connate in a plicate palman, often with numerous, free, marginal threadlike fibers; hastula prominent adaxially, narrowly triangular. Inflorescence interfoliar, highly compound-branched, the axes mostly covered by obliquely pointed, tubular, sheathing bracts, except the penultimate and ultimate branches. Flowers hermaphroditic, sessile, solitary; calyx tridentate, cupular; petals ovate-oblong, concave, valvate apically; stamens 6, exserted at anthesis by the spreading of the petals; stamen filaments subulate, connate basally and adnate to the base of the corolla; ovary 3-carpellate; style as long or longer than the ovary, grooved on three sides; stigma undivided, slightly capitate, papillose. Fruit brown or black, 1-seeded, globular to subpyriform with subbasal styler remains; mesocarp fleshy; endocarp membranaceous. Seed depressed-globose; endosperm homo-geneous. Seedling leaf narrowly lanceolate. Chromosome number $n = 18$.

TYPE SPECIES: *Sabal adansonii* Guersent, a synonymous name for the species now correctly known as *Sabal minor* (Jacq.) Persoon.

About 25 species distributed from the eastern United States through Mexico and Central America, and the Greater Antilles to South America, Trinidad and Tobago. Widely cultivated, especially in botanical gardens.

Sabal causiarum (Cook) Becc. in Webbia 2: 71. 1907; Britton & Wilson, Bot. Porto Rico 1: 116. 1923; Bailey in Gent. Herb. 3: 315-317, figs. 160, 172, 174, 175. 1934, 6: 426-428, figs. 216, 228, 229. 1944.

Basionym: *Inodes causiarum* Cook in Bull. Torrey Bot. Club 28: 531. 1901.

Type: Puerto Rico, Joyua, Cook 154 (us).

Syn.: *Sabal questeliana* Bailey in Gent. Herb. 6: 422-425, figs. 225, 227. 1944.

(Type: St. Bartholomew, *Questel s.n.* (BH).)

Large, heavy-trunked palm with conspicuously extended inflorescences. Caudex columnar, gray, 5-16 m. tall, ca. 40-75 cm. in diameter, self-cleaning but rough in texture, obscurely ringed. Leaf petiole 1 m. or more long, ca. 3-5 cm. wide, equaling or exceeding the blade; hastula 15-20(-30) cm. long, margins often prominently upturned; blade 1.5-2 m. long, strongly costapalmate, with a broad palman $\frac{1}{2}$ the length of the blade, dull green adaxially, light green or glaucous-green abaxially, with numerous, conspicuous filaments from the sinuses between the segments; segments 50-60 or more per leaf, 3-5 cm. broad, well over 1 m. long, usually rigid, rather firm textured, very slender pointed. Inflorescence commonly extending well beyond the leaves, primary bracts sharply pointed, ultimate branches slender, 3-8 cm. long, glabrous. Flowers white, slightly fragrant, ca. 4 mm. long at anthesis; petals more or less ascending or spreading, narrow, acute; pistil short, stout. Fruit globose-pyriform, asymmetrical, dark brown to nearly black, 10-13 mm. thick. Seed depressed, 8-10 mm. across, dark glossy brown.

GENERAL DISTRIBUTION: Endemic to Puerto Rico.

DISTRIBUTION IN LESSER ANTILLES: Often cultivated, reported to have been introduced into St. Bartholomew and Guadeloupe (Questel, 1941) where it is said to be naturalized. A note on the collection *H. E. Box 1471* states that it is "cultivated and abundantly spontaneous in and near old estate gardens" in Antigua.

THRINAX Swartz

Thrinax Sw., Prodr. 4, 57. 1788, Fl. Ind. Occ. 1: 613, t. 13. 1797; Bailey n Gent. Herb. 4: 128-149. 1938, 8: 94-99. 1949; Read in Smithsonian Contr. Bot. 19: 1-98. 1975. FIGURE 65.

Small to medium, solitary, unarmed palms; caudex columnar, tan to gray, smooth or fibrous, obscurely ringed with leaf scars; base often a mass of roots forming a mound on rock substrate. Leaves palmate; sheaths fibrous, at first tubular, velutinous, later becoming fibrous and netlike; petiole flat adaxially, convex abaxially, terminating in the blade at the hastula, splitting within the area of the sheath, thereby permitting emergence of the inflorescence; hastula conspicuous, various in outline, with an abaxial ridge, flap or small projection; leaf blade flabellate, entirely lacking a central costa, adaxial surface glabrous, abaxial surface variously lepidote; segments narrowly rhomboid, trullate, or obtusulate, mostly bifid at the apex, variously fused toward their bases forming a plicate palman. Inflorescences interfoliar, elongate, erect to arching, divided into numerous, pendulous primary branches, these mostly simply branched; lowermost primary bract bicarinate, the others tubular with an oblique aperture; all

primary bracts densely appressed-lepidote, each enclosing the base of a primary branch; primary branches each with a bicarinate and bifid bract, inserted midway along the flattened peduncle and partially enclosing the flowers prior to anthesis; each ultimate branch subtended by a narrow triangular bract. Flowers bisexual, mostly protandrous, solitary on prominent or very short bracteolate pedicels; perianth a 6-lobed or dentate cupule, not enclosing reproductive parts; stamens (5-)6-12(-15), the filaments usually straight, slender, mostly free, the anthers basifixed, auriculate basally, retuse apically, with linear to oblong locules dehiscent introrsely by lateral slits; pistil unilocular, uniovulate, with a narrow, very short style flaring upward to a laterally compressed infundibuliform stigma, the ovule with a well-developed funicular aril, erect at the base of the locule. Fruit small, depressed-globose, white at maturity, often with apical stigmatic and basal perianth remains persisting; epidermis smooth at maturity when fresh; mesocarp thin, mealy. Seed depressed-globose, smooth, tan when fresh, depressed basally at the hilum; endosperm homogeneous but intruded partially or completely through the center from base to apex by the testa; embryo lateral to subapical. Seedling leaf lanceolate, entire.

TYPE SPECIES: *Thrinax parviflora* Sw., of Jamaica.

Four species distributed throughout the islands of the northern Caribbean and nearby continental coastal areas bordering the Gulf Stream, from Mexico and Florida, eastward to Barbuda.

1. *Thrinax morrisii* H. Wendl. in Gard. Chron., ser. 3, 11: 104, figs. 20, 21. 1892; Morris in Kew Bull. Misc. Inf. 1891: 131. 1892; Read in Smithsonian Contr. Bot. 19: 88-93, figs. 55-57. 1975.

Type: Anguilla, Blowing Point, *H. A. Alford Nicholls s.n.*, Nov. 1891 (K).

Small to medium palm, 1-10.5 m. tall; caudex slender, slightly tapering above, ashy gray, smooth to fibrous, leaf and inflorescence scars prominent, becoming rimose with age, (5-)8-35 cm. in diameter at the base. Leaf sheaths 28-60 cm. long, at first long-linguiform, soon breaking apart and separating from the petiole apically, becoming somewhat netlike, densely tan- to white-velutinous at first, soon glabrescent; petiole 27-84 cm. long, at first densely white-lepidote abaxially, soon glabrescent, (1.0-)1.5-2.0 (-2.1) cm. wide at the sheath, 0.7-1.6(-2.0) cm. wide apically, hastula ovate obtuse, rarely pointed, erect, thin, 0.2-0.8 cm. long, up to 3 cm. wide, densely velutinous, ciliate, at first with dense, conspicuous tufts of white or silvery indumentum, becoming glabrescent; abaxial hastula rather inconspicuous, densely white-lepidote; budding, unexpanded leaf blade densely appressed-lepidote on all surfaces; expanded leaf usually glossy green adaxially, variously lepidote abaxially with spreading, interlocking, fimbriate, hyaline scales (especially when freshly expanded), becoming glabrescent in age, the abaxial surface usually appearing glaucous or pale blue-green as a result of numerous minute white dots in rows associated

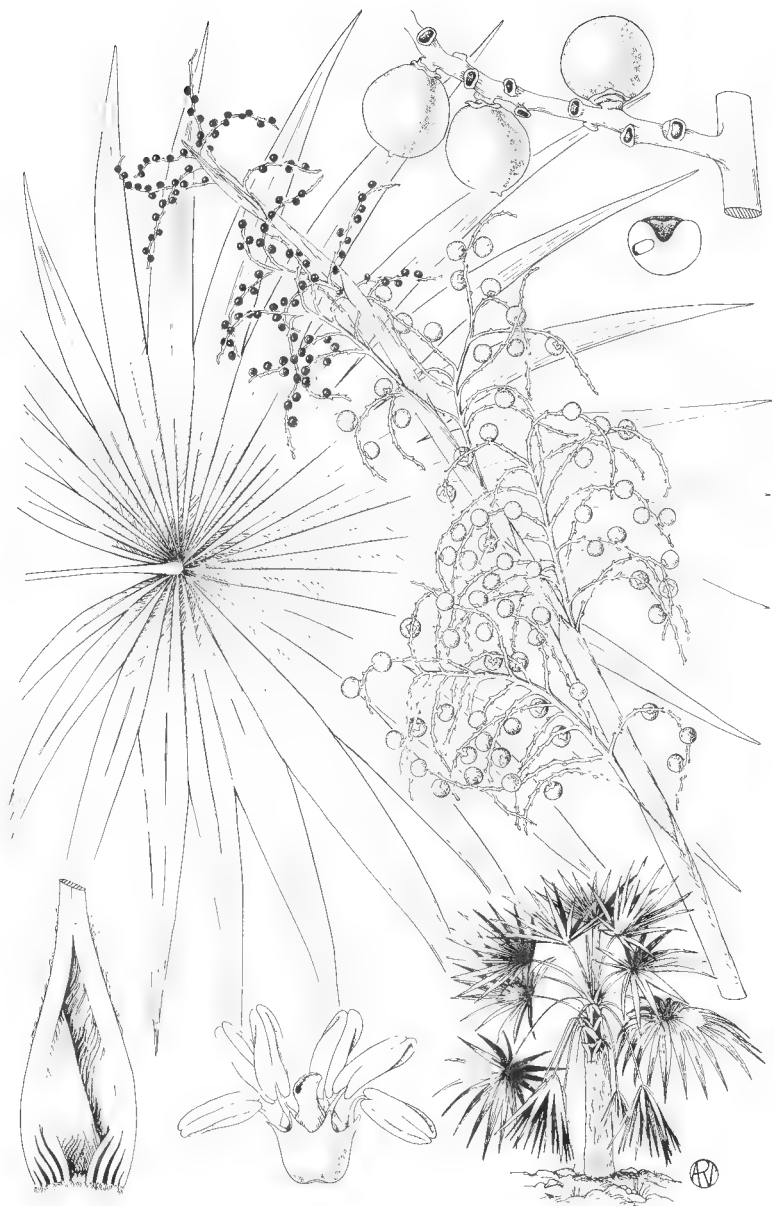


FIGURE 65. Palmae. *Thrinax morrisii*.

with sunken stomata, the color variable depending on age and exposure; leaf blade 75-150 or more cm. in diameter, nearly circular in outline, the segments rarely lying in the same plane (except in juvenile plants), the outer or lower segments often folded up and forward toward the apex of the blade thereby exposing the abaxial surface; palman 12-42 cm. broad; segments 33-58, rigid or lax, narrowly trullate to rhombic, often pinched about midway; the longest middle segments 55-75 cm. long, (2.3-)3.5-4.8 cm. wide, widest at point of fusion, apically bifid. Inflorescence 55-100 cm. long, erect or arcuate, equaling or greatly exceeding the leaves; primary bracts silvery-white- to tan-lepidote, often with apical tufts of long white scales; primary branches 9-21, glabrous, pendent or tufted-arcuate (when not fully exposed), (8-)9-30(-35) cm. long at anthesis, ultimate branches 20-50 each, 5.5-14.5(-20) cm. long, subtended by a narrowly triangular bract which is conspicuously tufted apically with white hyaline scales. Flowers white, becoming pale yellowish or even pale orange with age, situated on inconspicuous disclike pedicels; bracteoles triangular; perianth lobes mostly acute, triangular-apiculate, rarely attenuate or abruptly rather long-apiculate; stamens mostly 6, the filaments broadly connate basally into a cup or ring, often equaling the perianth in length, the anthers (0.8-)1.0-1.8(-2.0) mm. long, exceeding the pistil in length; stigmatic area infundibuliform, often ciliate, the ovary often turning orange after anthesis. Fresh ripe fruit (3.5-)4.0-4.5(-8.0) mm. in diameter (varying as much as 2 mm. in diameter on a single inflorescence), globose, with persistent stigmatic remains; pedicels 0.1-0.6(-0.8) mm. long. Seed depressed-globose, mahogany brown, (2.3-)2.7-4.2(-5.0) mm. in diameter, mostly only partly intruded at base by a conical cavity. Flowering in the spring (May-June). Chromosome number $n = 18$.

GENERAL DISTRIBUTION: Florida, Bahama Islands, Turks and Caicos, Greater Antilles and associated islands (except Jamaica), eastward to Barbuda.

DISTRIBUTION IN LESSER ANTILLES: Anguilla!, Barbuda!

COMMON NAMES: Pimetta (Barbuda); broom palm (Anguilla).

HABITAT: Deciduous seasonal bushland.

COCCOTHRINAX Sargent

Coccothrinax Sarg. in Bot. Gaz. 27: 87-89. 1899; Becc. in Webbia 2: 288-290. 1907; Bailey, in Gent. Herb. 8: 99. 1949. FIGURE 66.

Small to medium, solitary (rarely caespitose), occasionally armed palms; caudex slender, columnar, tan to gray, smooth or fibrous, obscurely ringed with leaf scars, base often a mass of roots forming a mound on limestone substrate. Leaves palmate, the sheaths fibrous, tubular, unarmed or with spinose margins, variously lepidote to glabrescent, becoming loosely net-like, or like heavy screening or grillwork; petiole flat to convex adaxially, convex abaxially, terminating in the blade at the hastula, solid, not split-

ting within the area of the sheath; hastula conspicuous adaxially, various in outline, with an abaxial ridge, flap or small projection; blade flabellate, entirely lacking a central costa, adaxial surface glabrous, abaxial surface variously lepidote; segments narrowly rhomboid, trullate or obtrullate, mostly bifid at the apex, variously fused toward their bases forming a plicate palman. Inflorescences interfoliar, elongate, erect to arching, mostly shorter than the leaves, divided into numerous, pendulous primary branches, these mostly simply branched; lowermost primary bract bicarinate, the others tubular with an oblique aperture; all primary bracts variously appressed-lepidote, each enclosing the base of a primary branch; each ultimate branch subtended by a narrow triangular bract. Flowers bisexual, mostly protandrous, solitary on prominent or very short bracteolate pedicels; perianth a 6-lobed or dentate cupule, not enclosing reproductive parts; stamens (?6-) 9-12, the filaments usually straight, slender, mostly free to only slightly connate basally, the anthers basifixed, auriculate basally, retuse apically, with linear to oblong locules, dehiscent laterally and introrsely by lateral slits; pistil unilocular, uniovulate, with a narrow, very short style flaring upward to a laterally compressed, infundibuliform stigma. Fruit small, depressed-globose, black or dark purple at maturity, often with apical stigmatic and basal perianth remains persisting, the epidermis smooth at maturity when fresh; mesocarp thin, fleshy; endocarp thin, membranaceous; seed globose, deeply sulcate or cerebriform; endosperm more or less ruminant by the sulcae deeply folded in irregular lobes. Seedling leaves narrowly lanceolate. Chromosome number $n = 18$.

TYPE SPECIES: *Coccothrinax jucunda* Sarg., now correctly known as *Coccothrinax argentata* (Jacq.) Bailey.

Twenty or more species distributed throughout the islands of the Caribbean and nearby continental coastal areas.

Coccothrinax barbadensis (Lodd. ex Mart.) Becc. in *Webbia* 2: 328-331. 1907; Questel, *Geogr. Gen. Guad. et Depend.* 149. 1951; Gooding *et al.*, *Fl. Barbados* 80. 1965; Beard, *Forest Trees Windward and Leeward Islands* 126. 1949. (Unpubl. thesis.)

Basionym: *Thrinax barbadensis* Lodd. ex Mart., *Hist. Nat. Palm.* 3: 257. 1845; Griseb. *Veg. Kariben Guad.* 111. 1857, *Fl. Br. W. Ind.* 515. 1864; Duss, *Fl. Phan. Ant. Fr.* 486. 1897.

Type: Barbados. No type specimen is known.

Syn.: *Coccothrinax martinicensis* Becc. in *Webbia* 2: 324-326. 1907; Hodge in *Carib. For.* 3(3): 109. 1942, in *Lloydia* 17: 153, 154. 1954; Stehlé in *Fl. Agron. Ant. Franç.* 10: 26. 1958. (Type: Martinique, Vallée de St. Pierre, *Hahn 1531* (B).)

Coccothrinax boxii Bailey in *Gent. Herb.* 8: 113, *figs. 24, 25.* 1949. (Type: Antigua, The Highlands, *Box 669!* (BH).)

Coccothrinax dussiana Bailey in *Gent. Herb.* 8: 109, 110, *figs. 20, 21.* 1949. (Lectotype: Guadeloupe, *Duss 3797!* (B).)

Coccothrinax sabana Bailey in *Gent. Herb.* 8: 110, *figs. 4, 22, 23.* 1949. (Type: Saba, *Bailey 406!* (BH).)

Thrinax radiata Griseb., Fl. Br. W. Ind. 515. 1864, non J. A. & J. H. Schultes.
Thrinax parviflora Maycock, Fl. Barb. 146. 1830, non Sw.
Palmetto the Lesse, Richard Ligon, A True & Exact History of the Island of Barbados 74. 1657.

Small to medium, solitary palms to ca. 5-15(-22) m. tall; caudex slender (7-)10-18(-20) cm. in diameter, ashy gray, smooth to fibrous, leaf and inflorescence scars often visible, becoming rimose with age. Leaves 12-15 in number; sheaths becoming finely netlike; petiole biconvex, densely lepidote within the sheath portion, glabrescent elsewhere, 1.0-1.2 m. long, ca. 1-1.5(-2) cm. wide; hastula irregularly triangular-acute, erect, 2 cm. long, 2-3 cm. or more wide, densely lepidote at first; blade 1 m. or more broad, not always circular in outline, usually glossy green adaxially, variously lepidote abaxially with spreading, interlocking, fimbriate, hyaline scales (especially when freshly expanded), only becoming glabrescent when very old (or on juvenile leaves), the abaxial surface usually appearing quite silvery; segments 50-70 in number, rigid or lax, narrowly trullate to rhombic, acuminate, 2-4.5 cm. wide (widest at point of connation), ca. 60-90 cm. long (hastula to apex), often apically bifid. Inflorescence 25-45 cm. long, erect or arcuate, shorter than the leaves, with 4-10 primary branches; scape bracts lightly lepidote apically; primary branches glabrous, pendent, 10-20 cm. long at anthesis (up to 30 cm. long in fruit), ultimate branches 6-25 cm. long, the uppermost branches rarely again branched. Flowers pale yellowish, fragrant, pedicellate; bracteoles triangular; perianth lobes mostly acute, triangular; stamens 9-12, the filaments connate slightly at the base, anthers 1-2 mm. long; stigma obliquely infundibuliform, entire to crenulate, on a short narrow style. Fruit 7-12 mm. in diameter, flattened, globose, with persistent stigmatic remains; pedicels 1-5 mm. long; seed globose, 6-10 mm. in diameter, endosperm sulcate, cerebriform, sometimes separating nearly to the center of the seed.

GENERAL DISTRIBUTION: The Windward and Leeward Islands, Trinidad and Tobago. Probably also the same taxon found in the Virgin Islands and Puerto Rico.

DISTRIBUTION IN LESSER ANTILLES: Saba!, Barbuda!, Antigua!, Guadeloupe!, Marie Galante!, Dominica!, Martinique!, St. Lucia!, Barbados!.

COMMON NAMES: Palmier a balai, Latanier balai (Guad., Mart.); Latanier (Guad., St. Lucia, Dominica); Allatani (Carib name); Palmetto (Barbuda); Thatch Palm (various places).

HABITAT: Littoral woodland and scrub woodlands on limestone near the coast, from sea level to 200 m. elevation.

OBSERVATIONS: Many authors, including the present writer, concur with Beard's comment: "a single *Coccothrinax* population formerly existed throughout the islands, but since man's arrival it has become exterminated in the wild on many islands" (Forest trees of the Windward and Leeward Islands 126. 1949. (unpubl. thesis)).

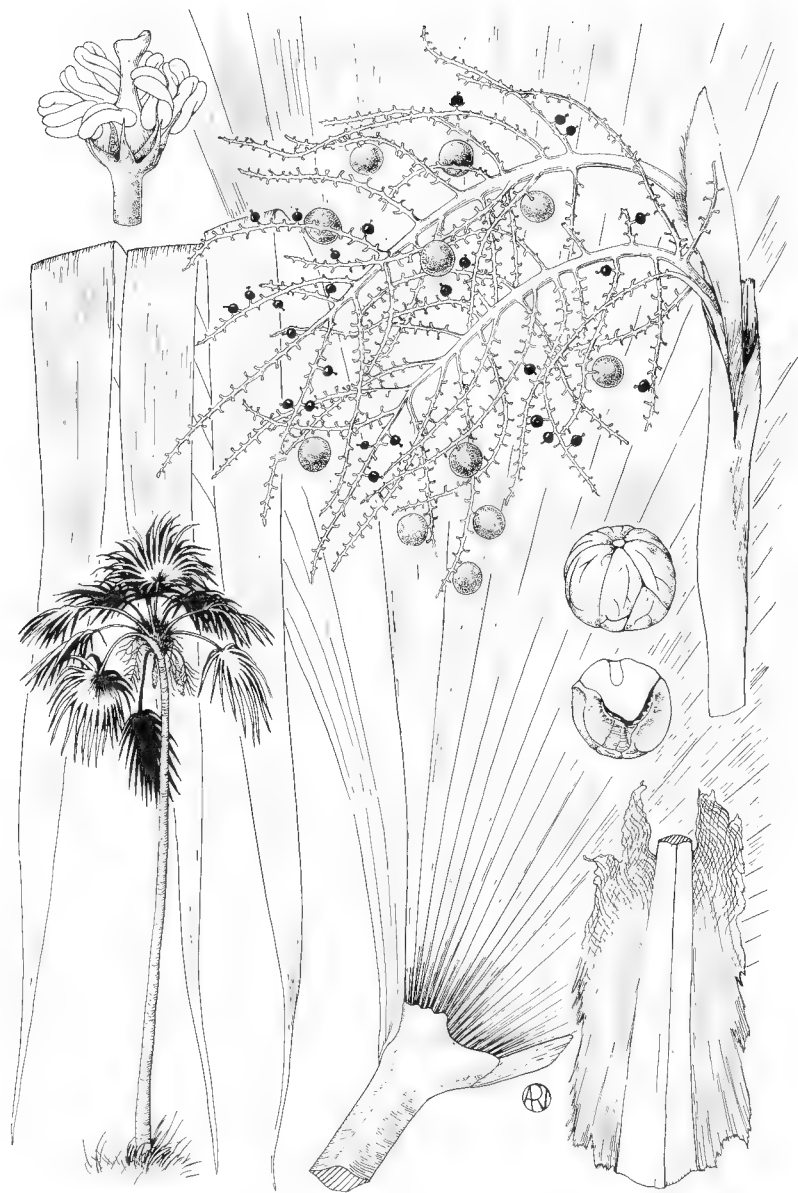


FIGURE 66. Palmae. *Coccothrinax barbadensis*.

DESMONCUS Martius, nom. cons.

Desmoncus Mart., Palm Fam. 20. 1824, nom. cons.; Hist. Nat. Palm. 2: 84. 1824; Bailey in Gent. Herb. 7: 368, 369. 1947; Wessels Boer, Indigenous Palms Suriname 107-109. 1965. FIGURE 67.

Slender, weak-stemmed, scandent, armed palms; caudex unarmed but completely covered with old leaf bases. Leaves pinnate, the sheaths long, tubular, projecting well above the insertion of the petiole as an ocrealike tubular ligule; petiole short or absent; the sheath, petiole, tubular ligule, and rachis usually all variously prickly; segments regularly inserted in a single plane; the rachis extended, slender and whiplike with modified leaf segments represented as retrorsely pointing spines which serve as climbing hooks. Species monoecious. Inflorescence interfoliar, simply branched; peduncle terete, elongate, the first and second nodes with markedly unequal primary bracts, the first or outer bract terete, much shorter than the second, the second terete to somewhat inflated-fusiform, variously spiny or prickly, splitting open on one side; the peduncle and rachis finely prickly or not; branches usually unarmed. Flowers borne superficially on the slender branches, in triads of a single pistillate and two staminate, but often with only staminate flowers paired or solitary toward the apex. Staminate flowers with a shallow saucerlike tridentate calyx and 3 oblique lanceolate acuminate petals; stamens 6-9, the filaments connate and adnate to the corolla. Pistillate flowers with much-reduced, shallow, saucerlike calyx; corolla cuplike, tridentate, with connate petals; staminodia present or absent; ovary trilocular, stigma trifid; stigmatic remains apical on fruit. Fruit elliptic to globose, 1-seeded, reddish; mesocarp thin, yellow; endocarp with 3 pores above the middle; endosperm homogeneous, white, solid. Chromosome number unknown.

TYPE SPECIES: *Desmoncus polyacanthos* Mart., typ. cons.

About ten species (but usually reported to have many more) distributed throughout tropical Central and South America, Trinidad and Tobago, with a single collection of one species from the island of St. Vincent in the Lesser Antilles.

Desmoncus polyacanthos Mart., Hist. Nat. Palm. 2: 85, 86. 1824, 2: tab. 68. 1826; Wessels Boer, Indigenous Palms Suriname 113-119, figs. 4-6. 1965.

Type: Brazil, *Martius Icon.*, Hist. Nat. Palm. 2: tab. 68. 1826.

Syn.: *Desmoncus prestoei* Bailey in Gent. Herb. 6: 215-218, fig. 110. 1943, 7: 376, fig. 157. 1947; Wessels Boer, Indigenous Palms Suriname 113. 1965. (Type: Trinidad, W. E. Broadway 5568 (BH(?); TRIN(?)).)

Slender-stemmed, scandent, small palm, highly variable in size and armature, depending on the habitat. Caudex 0.5-1 cm. in diameter, unarmed but completely covered with leaf sheaths. Leaves inserted ca. 15 cm. apart; sheaths 20-25 cm. long, the tubular ligule 10-15 cm. long, both sheath and ligule sparsely to densely armed with slightly recurved prickles 0.5-1 cm.

long; petiole short to absent, petiole and rachis sparsely armed with short, strongly recurved catclaw spines; petiole, sheath, and rachis all variously lepidote with dense or widely scattered scales; segments 8-12 on each side of the rachis, each 15-20 cm. long, 3-5 cm. broad near middle, regularly arranged, subopposite to paired, spreading in a single plane, rarely with a few short recurved spines on the abaxial midnerve and sparsely lepidote on the margins; terminal whip 40-50 cm. long, with 4-6 pairs of leaflet-hooks, each 1-5 cm. long, and numerous, widely spaced, recurved catclaw prickles. Inflorescences two to several at a time, interfoliar; primary bracts leathery, inserted well apart on the peduncle; the first bract sparsely armed, 30-40 cm. long, tubular with an oblique apical opening, the second 20-40 cm. long, 3-4 cm. thick, variously lepidote, more or less densely beset with short recurved hooklike bulbous-based prickles, inserted above the apex of the outer bract; peduncle 35-45 cm. long, sparsely to conspicuously armed with fine prickles; rachis 10-12 cm. long, mostly unarmed, with 8-15 simple, sinuous branches, each 4-6 cm. long, rarely the lowermost branch bifurcate. Flower clusters subtended by 2 or 3 low bracteoles, flowers mostly in triads, often with paired or solitary staminate flowers apically on branches. Staminate flowers in the triad lacking subtending bracts except the largest bract of the cluster usually extending partly about the base of one staminate flower; staminate flowers with a very small, tridentate, shallow, completely connate calyx about 0.5 mm. high; petals lanceolate, very long-acuminate, 5-6 mm. long; stamens 6, the filaments connate, the anthers straight, 1 mm. long. Pistillate flowers globular-ovoid, sessile; calyx a broad, shallow, saucerlike, tridentate ring; corolla a tridentate cupule, the petals entirely connate, about 2 mm. high, staminodia absent or minute (?); pistil completely enveloped by the corolla, only the short trifid stigma and short style visible. Fruit 15 mm. in diameter, obovoid, yellow to orange or red at maturity, 1-seeded; endocarp with 3 pores above the middle; endosperm solid, white, homogeneous. Chromosome number unknown.

GENERAL DISTRIBUTION: Widely distributed, but not necessarily common in tropical South America and Trinidad, with a single collection in the Lesser Antilles.

DISTRIBUTION IN LESSER ANTILLES: St. Vincent! (*H. H. & G. W. Smith 1713*, Mar. 1890. "Northern side of Mt. St. Andrews, swampy ground near streams. 1500 ft. Not seen elsewhere, and no flowers nor fruit observed. Runs over bushes and trees.")

HABITAT: Usually an understory palm of mesophytic forest, or along river margins.

AIPHANES Willdenow

Aiphanes Willd. in *Mém. Acad. Sci. Berlin* 1804: 32. 1807; Burret in *Notizbl. Bot. Gart. Berlin* 11: 557-572. 1932; Bailey in *Gent. Herb.* 3:

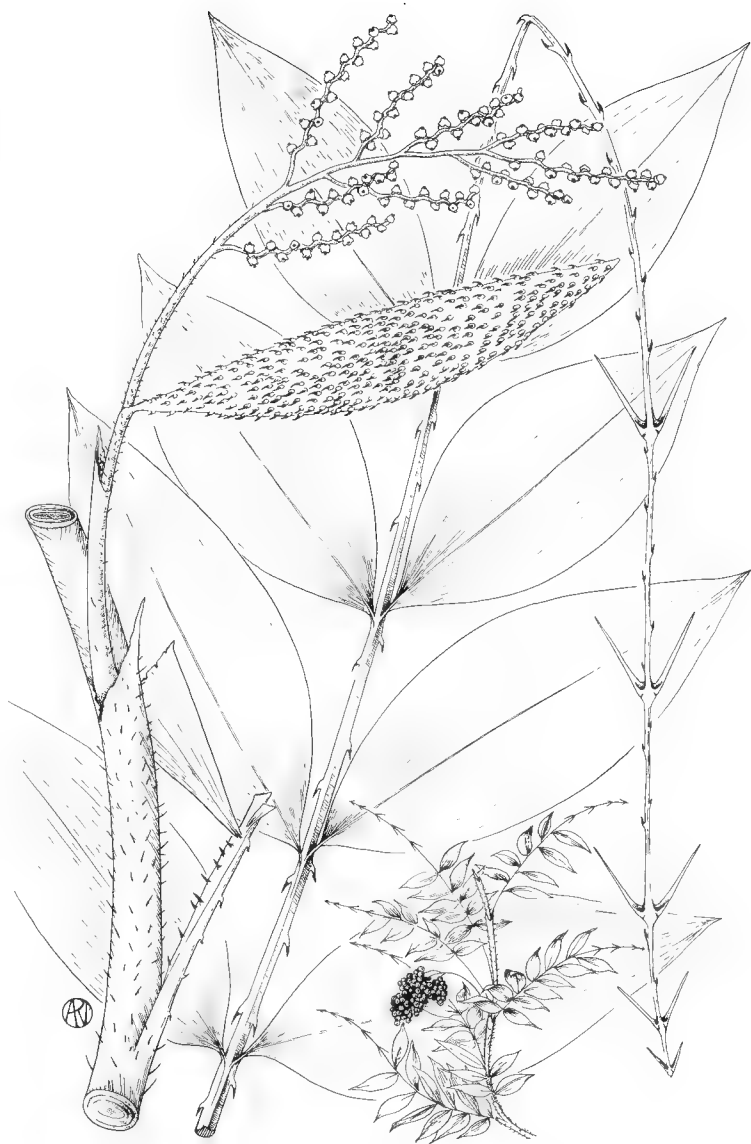


FIGURE 67. Palmae. *Desmoncus polyacanthos*.

113. 1933, 4: 181-184. 1938, 8: 164-173. 1949; Moore in *Principes* 7:
125. 1963, in *Gent. Herb.* 11: 111. 1973. FIGURE 68.

Syn.: *Curima* Cook in *Bull. Torrey Bot. Club* 28: 561. 1901. (Lectotype: *Curima colophylla* Cook = *Aiphanes acanthophylla* (Mart.) Burre.)

Tilimia Cook in *Bull. Torrey Bot. Club* 28: 565. 1901. (Lectotype: *Tilimia caryotaefolia* (H.B.K.) Cook [Moore in *Gent. Herb.* 9: 274. 1963] = *Aiphanes caryotaefolia* (H.B.K.) Wendl.)

Martinezia auct., non Ruiz & Pavon, 1794.

Small to medium, solitary, usually strongly armed palms; caudex with conspicuous leaf scars but more often conspicuously ringed with long dark prickles on the internodes. Leaves pinnate, the sheaths early splitting into shreds, usually densely prickly, at first extended above the insertion of the petiole as a closed tubular ligule which becomes shredded before the leaf is completely matured, abscissing cleanly; petiole various but usually densely armed with long prickles; rachis convex beneath, variously ridged above, often variously armed with prickles, glabrescent to densely matted-lepidote; segments erose, truncate, usually broadest apically, often with one margin extended, fingerlike, reduplicate basally or occasionally broadly inserted along the rachis, armed or not, but usually densely prickly on one or both surfaces of juvenile plants. Species monoecious. Inflorescences interfoliar, normally once-branched; peduncle terete or slightly elliptic, usually densely and formidably armed with long dark prickles, elongate, arching to pendent, the first and second nodes with large, markedly unequal, persistent primary bracts, the first bract bicarinate to ancipitous, usually unarmed, much shorter than the second; the second bract narrow, terete, sometimes rostrate, contained within the first, often densely armed with large or small prickles but sometimes unarmed; rachis often armed with prickles toward the base, unarmed above, both the rachis and branches variously lepidote, the scales usually closely appressed and inconspicuous, but intermediates between scales and tiny prickles often evident, once-branched; branches sinuous, divaricate. Flowers usually in triads of a single pistillate and two staminate, the triad often sunk in a depression on the rachis (this formed by a thickened tertiary bract), the flowers also occurring as paired or solitary staminate flowers (or, in one specimen studied, the flowers in quadrads of paired pistillate flowers, each flower with an associated staminate bud), the flower clusters usually subtended by 2 or 3 minute bracts in addition to the pit bract, the staminate flowers lacking associated bracts except when they alone are paired or solitary toward the apex of the branch. Staminate flowers often stipitate, usually also pedicellate, with the sepals connate basally but with acute to narrowly triangular apices; petals essentially free, but slightly connate basally, valvate elsewhere, variously sculptured adaxially conforming with the position of the anthers in bud; stamens 6, filaments straight, very shortly connate and adnate to the petals basally, anthers versatile, sagittate basally, retuse apically; pistillode present, conic to globular and trifid. Pistillate flowers sessile, with free, broadly imbricate sepals; petals valvate, about half con-

nate; staminodial cup for the most part adnate to the petals, often exposed between the petals after anthesis; ovary globose to pyriform, tricarpellate; style very short; stigmas three; stigmatic remains apical in fruit. Fruit globose, 1-seeded, scarlet red at maturity; mesocarp yellow; endocarp bony, variously sculptured, with three pores usually equatorial in position; seed irregular in form, the embryo opposite one of the endocarp pores; endosperm homogeneous. Seedling leaves bifid or not conspicuously so, the segments with broad irregular apices, usually very densely armed with long conspicuous prickles. Chromosome number $n = 15$.

TYPE SPECIES: *Aiphanes aculeata* Willd.

An extremely complex genus of about 30 species widely distributed throughout the West Indies and South America. Much of the difficulty arises from the lack of sufficient collections of comparable material because of the difficulty in collecting and preparing of specimens. Adequate collections have been made on Barbados and Dominica, and several excellent collections have been made on St. Lucia, but they simply reflect the need for additional collecting and field study of the ranges and the variability of the one or more species still to be adequately distinguished. The occurrence of *Aiphanes* species on Martinique remains a source of confusion, since only fragmentary collections of the indigenous plants are available. With our present knowledge of the complex, it is impossible to apply existing names or reliably identify specimens.

KEY TO THE SPECIES

The following key to the species (modified slightly from Bailey in Gent. Herb. 8: 165. 1949) will not identify all collections but should be useful in aligning certain collections with those described from St. Lucia and St. Vincent.

1. Second primary bract very narrow, grasslike, unarmed; inflorescence small, slender and hanging on a long peduncle, with few short branches; nutlet not pitted. *A. luciana*
- 1a. Second primary bract woody, flattened or cylindric, coming to a distinct point, sometimes armed; inflorescence a heavy structure with many branches, not slenderly peduncled. 2
2. Leaf segments nude underneath (unless sometimes at base); nutlet not noticeably pitted; leaf segments with nearly or quite parallel sides above the base. *A. erosa*
- 2a. Leaf segments bearing prickles underneath on the veins. 3
3. Surface of the second primary bract not spiniferous; nutlet very veiny, not pitted. *A. vincentiana*
- 3a. Surface of the second primary bract prominently spiniferous on lower half; nutlet prominently pitted. *A. minima*

Aiphanes luciana Bailey in Gent. Herb. 8: 166, fig. 65. 1949.

Type: St. Lucia, Barre de l'Isle, Bailey 440! (BH).

Medium-sized solitary palm, to 8 m. tall, moderately armed; caudex 10-13 cm. in diameter, ringed at intervals with upward-pointing, 1-6 mm. long, black prickles, becoming clean with age, roots prominent, 30-60 cm. above ground. Leaves about 2 m. long; petiole armed with slender downward-pointing, 1-2 cm. long prickles, being progressively more sparsely distributed apically; rachis practically unarmed except for a very few prickles at the petiole juncture; segments alternate or subopposite, 18-20 pairs, 40-50 cm. long, 3-5 cm. broad, the apices obliquely erose with a long, acute, fingerlike projection on the apical margin, unarmed, margins entire, green on both surfaces but lighter abaxially and somewhat glossy adaxially. Inflorescences occurring singly, 1 m. in length, simply branched, slender, recurving or hanging; peduncle very slender, densely armed with forward-pointing or divaricate, hairlike prickles 2-4 cm. long; primary bracts unarmed, the second linear or straplike ("grasslike"), about 1 m. long, pendent; branches very slender, undulate, 10-15 cm. long. Flowers 2-3 mm. long, yellow. Fruit depressed-globular, red at maturity, 15 mm. in diameter, abruptly pointed; mesocarp thin; endocarp thick and hard, obscurely areolate but hardly pitted. Seed 5-7 mm. thick.

GENERAL DISTRIBUTION: Said to be endemic to the island of St. Lucia in the Lesser Antilles, but this species may also occur on Dominica.

DISTRIBUTION IN LESSER ANTILLES: St. Lucia; Dominica! (?).

HABITAT: An understory element in dense rain forests.

OBSERVATIONS: Specimens collected on St. Lucia by Howard & Weaver (17935) and Proctor (17603) do not match the type or the description of this species. However, specimens from Dominica collected by Read and Ernst (2023, 2024) and Read (74-217) more closely match this species than any other. Based on the character variations present in collections from St. Lucia (especially size and armature), it is obvious that the complex is composed of either two distinct species or a single, extremely variable one; additional study of this genus on St. Lucia is needed.

Aiphanes vincentiana Bailey in Gent. Herb 8: 170, fig. 68. 1949.

Type: St. Vincent, Cumberland Valley, *Beard* 230! (BH).

Large, much-armed palm; caudex 40-50 cm. in diameter, ringed with large, flattened prickles 10 cm. in length. Leaves about 3 m. long; sheath 5-7 cm. long, conspicuously flat; petiole densely armed with both short and long, 0.5-4.0 cm. long, downward-pointing prickles; rachis with only minute or very short prickles; segments 50-60 pairs, about 1 m. long, 7-9 cm. broad, closely placed, glabrous, green on both surfaces, bearing many prominent secondary nerves, margins entire, smooth, apically erose with an extended, fingerlike projection on apical margin, with few, short, 1-2 cm. long prickles on abaxial surface near end of leaf. Inflorescences about 80 cm. long; peduncle 50-60 cm. long, strongly armed at the base, but naked apically; second primary bract about 1 m. long, woody, flattened or cylin-

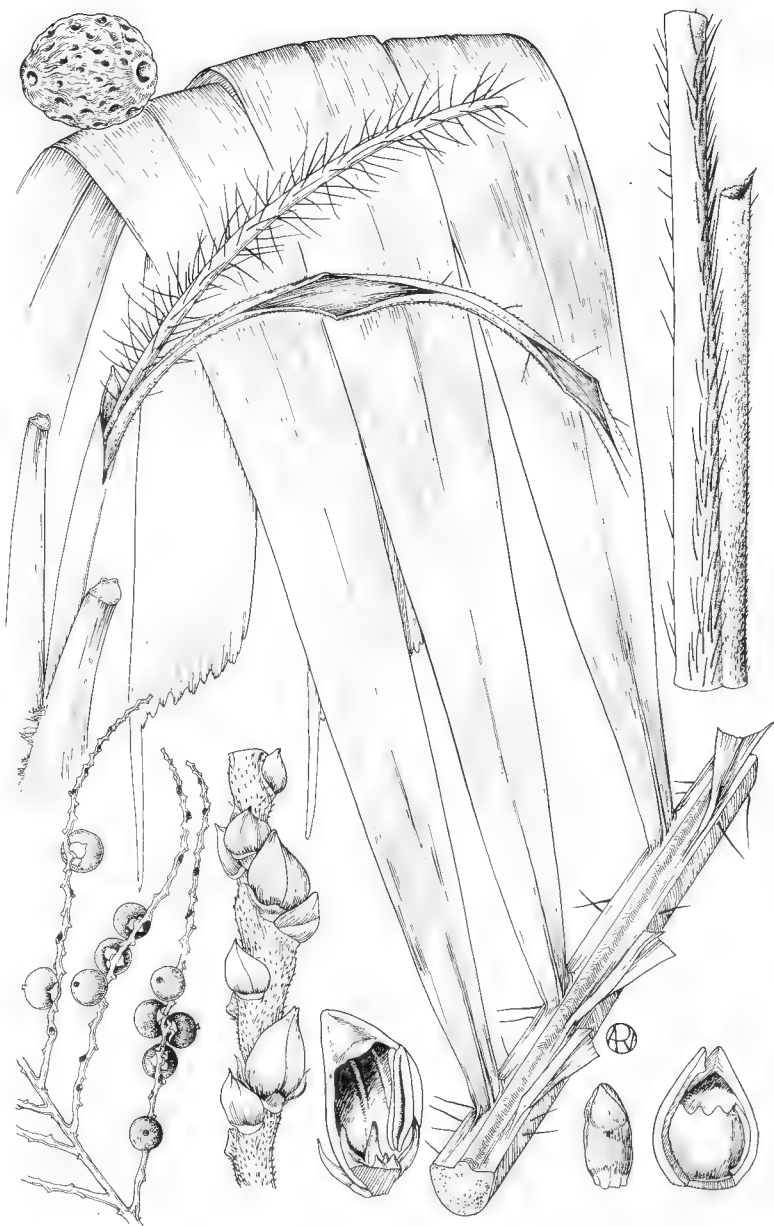


FIGURE 68. Palmae. *Aiphanes luciana*.

dric, distinctly rostrate, narrow, only sparsely armed with prickles; branches numerous, the larger ones 2-3 mm. thick (when dry) the apical portions very fine; floral pits (in fruit) shallow and small. Fruit nearly globular, vermilion in color at maturity, 1.4-1.5 cm. in diameter at maturity, beaked apically, tapered basally; endocarp not pitted but marked with light-colored flecks, rather veiny. Seed 7-8 mm. thick; endosperm homogeneous.

GENERAL DISTRIBUTION: Said to be endemic to the island of St. Vincent in the Lesser Antilles, but is remarkably like specimens from other islands except for certain apparently variable characters.

DISTRIBUTION IN LESSER ANTILLES: St. Vincent.

HABITAT: Forests, woodlands and thickets.

NAMES OF UNCERTAIN APPLICATION

Aiphanes erosa (Linden) Burret in Notizbl. Bot. Gart. Berlin 11: 558. 1932; Bailey in Gent. Herb. 3: 113. 1933, 4: 183, 184. 1938, 8: 165, 166. 1949; Moore in Principes 7: 125, 172. 1963; Gooding *et al.*, Fl. Barbados 85. 1965; Beard, Forest Trees Windward and Leeward Islands 125. 1949. (Unpubl. thesis.)

Basionym: *Martinezia erosa* Linden, Catalogue 87: 5. 1871.

Type: None known.

The original diagnosis in Linden's *Catalogue* cited only the Antilles as the source, and only described a juvenile plant sufficiently to place it in the genus (our knowledge is still too incomplete to accurately identify species from juvenile foliage). Burret did not typify the species, but equated it with several horticultural illustrations. He then designated plants from Barbados, Guadeloupe (cult.), Martinique (cult.), St. Vincent, and Grenada, as conspecific under the name *Aiphanes erosa*. Until a comprehensive revision of the genus in the Lesser Antilles is completed and the species name is typified, it is impossible to use this name with confidence.

Aiphanes minima (Gaertner) Burret in Notizbl. Bot. Gart. Berlin 11: 558. 1932; Bailey in Gent. Herb. 3: 113. 1933, 8: 170, 173. 1949; Beard, Forest Trees Windward and Leeward Islands 125. 1949. (Unpubl. thesis.)

Basionym: *Bactris minima* Gaertner, Fruct. & Sem. 2: 269, t. 139, fig. 5. 1791.

Name of uncertain application, based solely on a seed.

Type: Gaertner Icon., Fruct. & Sem. t. 139, fig. 5. 1791, without locality.

Syn.: *Aiphanes corallina* (Mart.) Wendl. ex Griseb., Fl. Br. W. Ind. Isl. 521. 1864; Moore in Principes 7: 125. 1963. References with regard to name, not necessarily to type. (Basionym: *Martinezia corallina* Mart., Palm. Orbign. 76. 1847; Duss, Fl. Phan. Ant. Fr. 490. 1897, nom. illeg. Type: Martinique (?), Plumier, Icon. tab. XXXIX, XL, XLI.)

Curima corallina (Mart.) Cook in Bull. Torrey Bot. Club 28: 563. 1901.

Acrocomia globosa Lodd. ex Griseb., Fl. Br. W. Ind. Isl. 522. 1864.

Grisebach cited "*Acrocomia globosa* Lodd. (introduced from S. Vincent) is according to Wendland also an *Aiphanes*, compared on account of its 'linear truncate leaf segments'."

ACROCOMIA Martius

Acrocomia Mart., Hist. Nat. Palm. 2: 66. 1824, 3: 285. 1845; Bailey in Gent. Herb. 4: 420-437. 1941; Moore in Gent. Herb. 9: 246. 1963; Wessels Boer in Mem. N. Y. Bot. Gard. 23: 102. 1972. FIGURE 69.

Large, solitary, armed palms; caudex often columnar, variously tumid, fusiform, or ventricose, usually heavily armed at first, becoming smooth with age and weathering. Leaves pinnate, the sheaths disintegrating early, persistent or abscising cleanly, usually heavily armed; petiole rarely evident; rachis variously armed with large flat prickles; segments numerous, narrowly lanceolate, apically pointed or bifid, inserted singly or in clusters, spreading to arching, usually multifarious except apically on the leaf, usually glabrous and glossy green adaxially, glaucous-green and often pubescent or pilose abaxially. Species monoecious. Inflorescences interfoliar, once-branched; peduncle stout, arching, usually densely lepidote and strongly armed; the first and second nodes with large, markedly unequal primary bracts, the first bract much shorter than the second, rapidly deteriorating, the second woody, rostrate, furfuraceous or brown tomentose-lepidote, variously armed; branches thickened and variously flexuous or crooked basally, densely pitted apically. Flowers rarely found in triads, rather they are markedly unequal in size and shape with the larger pistillate flowers (occasionally with associated staminate flowers) restricted to the lowermost flexuous portion, the smaller, solitary staminate flowers crowded on the densely pitted apical portion. Staminate flowers inserted in pits, solitary (except when associated with pistillate flowers); sepals free, scarcely imbricate basally, much shorter than the petals; petals connate basally, valvate apically; stamens 6, filaments slender, inflexed in bud, basally adnate to the petals, anthers versatile; pistillode prominent, trifid. Pistillate flowers with free, broadly imbricate sepals; petals free, mostly imbricate except apically where very shortly valvate; staminodia present as a broad, minutely denticulate cupule; ovary tricarpellate, variously lepidote or pubescent; stigmas sessile, narrow, recurved; stigmatic remains apical and conspicuous on fruit. Fruit depressed-globose, 1-seeded, olive green to yellowish, exocarp chartaceous; mesocarp fibrous, mucilaginous; endocarp bony, triplicate; endosperm homogeneous. Chromosome number $n = 15$.

TYPE SPECIES: *Acrocomia sclerocarpa* Mart., an illegitimate name for the species now correctly known as *Acrocomia aculeata* (Jacq.) Lodd. ex Mart.

An undetermined number of species distributed throughout the West Indies, Mexico, Central and South America. Apparently only one variable species occurs in the Lesser Antilles.

Acrocomia aculeata (Jacq.) Lodd. ex Mart., Hist. Nat. Palm. 3: 286. 1845; Bailey in Gent. Herb. 4: 469-471, figs. 254, 268, 293. 1941; Hodge in Carib. For. 3: 103-109, figs. 1-6. 1942, in Lloydia 17: 149-154, fig. 77. 1954; Gooding et al., Fl. Barbados 84. 1965.

Basionym: *Cocos aculeata* Jacq., Select. Stirp. Amer. 278. t. 169. 1763.

Type: Martinique, Jacquin Icon. Tab. 169.

Syn.: *Acrocomia karukerana* Bailey in Gent. Herb. 4: 466, 467, figs. 267, 292. 1941; Beard, Forest Trees Windward and Leeward Islands 125. 1949. (Unpubl. thesis.) (Type: Guadeloupe, Basse Terre, Bailey 16! (BH).)

Acrocomia antiguana Bailey in Gent. Herb. 8: 142-144, figs. 50-52. 1949. (Type: Antigua, Tremontania, Bailey 609! (BH).)

Acrocomia christopherensis Bailey in Gent. Herb. 8: 140-142, figs. 48-50. 1949. (Type: St. Christopher (St. Kitts), Ottley's plantations, Bailey 404! (BH).)

Acrocomia grenadana Bailey in Gent. Herb. 8: 144-147, figs. 50, 53. 1949. (Type: Grenada, Richmond Hill by St. Georges, Bailey 430! (BH).)

Acrocomia lasiospatha Griseb., Syst. Veg. Karaiiben 111. 1857, Fl. Br. W. Ind. Isl. 521. 1864, as to plants of Barbados, non Martius.

Acrocomia sclerocarpa Mart., Hist. Nat. Palm. 2: 66. 1824; Griseb., Fl. Br. W. Ind. Isl. 521. 1864; Duss, Fl. Phan. Ant. Fr. 489. 1897. References with regard to name only.

Acrocomia fusiformis Maycock, Fl. Barb. 355. 1830, non (Sw.) Sweet.

Bactris pavoniana Griseb., Fl. Br. W. Ind. Isl. 520. 1864, non Martius.

Stout, columnar, solitary, heavily armed palm; caudex variously tumid, ventricose or fusiform, straight or leaning, 10-20 m. tall, 30-50 cm. in diameter, usually enlarged above or at the middle in old plants (habit and degree of armature probably resulting from the influence of habitat, exposure or age), becoming gray and more or less smooth with age, irregularly marked by leaf scars, but usually when young also by clusters of large, flattened prickles 2-4 cm. long. Leaves numerous, strongly multifarious, usually persisting until drooping and hanging below the crown about the upper portion of the trunk; sheath fibrous with numerous prickles; petiole heavy and densely armed with large prickles, abscissing cleanly from the trunk; blade 2-3 m. long; rachis variously lepidote, frequently armed with 1-5 cm. long prickles; segments 50-60 on each side of the rachis, clustered, inserted at close intervals, each 1 m. long, 2-4 cm. broad at the middle, green to glaucous-green and sparsely to densely fine-pubescent abaxially, interspersed with minute, fine pricklike hairs, the apex acute, attenuate or bifid. Inflorescence heavy, the second primary bract 1-2 m. long, fusiform at first, becoming flattened, hoodlike or often hanging below the inflorescence with age, 25 cm. wide at the middle, long-acuminate, densely brown-lepidote and appearing covered with velour or felt, often bearing a few scattered spinous prickles; peduncle heavy, 3 cm. in diameter, often densely armed with 1-2 cm. long prickles; rachis 1 m. long, glabrous, branches 10-30 cm. long, glabrous. Staminate flowers 5-6 mm. long, yellowish at anthesis; sepals free, 1.5-2 mm. long, 2 mm. wide, ovate-triangular, scarcely imbricate; petals 5-6 mm. long, 2.5 mm. wide, rounded-acute apically, connate about $\frac{1}{3}$ their length, valvate above, strongly fibrous,

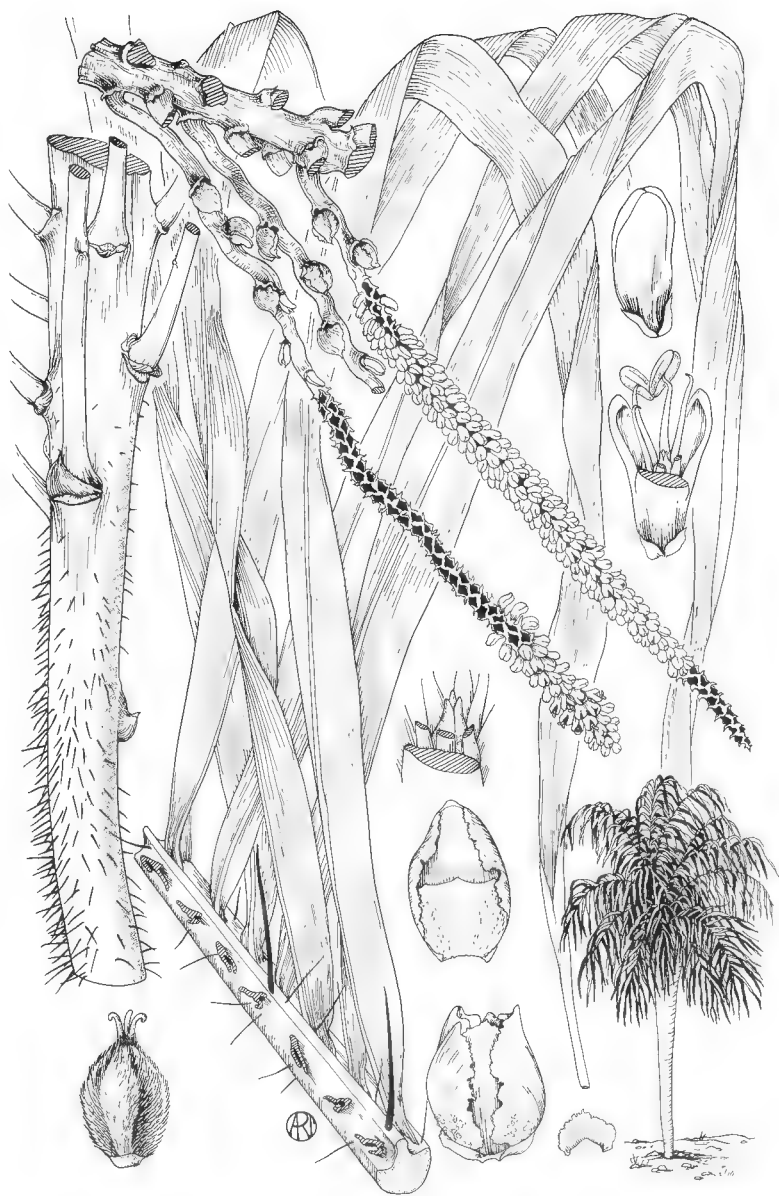


FIGURE 69. *Palmae. Acrocomia aculeata.*

adnate basally with thickened base composed of stamen-filaments and pistillode; stamen filaments slender, inflexed in bud; anthers 2 mm. long; pistillode trifold. Pistillate flowers 1 cm. long; sepals free, broadly rounded, the margins erose; petals free, strongly imbricate, the margins very irregular, slightly valvate (?) only at the very apex; staminodial cup, 6-denticulate, finely pubescent adaxially; ovary ovoid, pubescent; stigmas 3, essentially sessile, separating to recurving and exerted at anthesis. Fruit variable in size, 3-4.5 cm. in diameter, 2.5-3.5 cm. high, yellowish-green to pale orange at maturity, smooth, brownish-lepidote to glabrescent when dry; nutlet nearly globular, 3 cm. thick; seed regular or very irregular in outline, 2 cm. or less thick.

GENERAL DISTRIBUTION: Primarily a lowland species distributed throughout the Lesser Antilles.

DISTRIBUTION IN LESSER ANTILLES: Antigua!, St. Kitts!, Guadeloupe!, Marie Galante!, Dominica!, Martinique!, St. Lucia!, St. Vincent!, Grenada!, Barbados (?).

COMMON NAMES: Grou grou (Mart.); Palmiste Espineux (Mart.); Glou glou (Dominica); Gru gru (Dominica, Barbados); Palmier Dindé (Guad.); Macaw Palm (Leeward Isles).

HABITAT: Lowlands, dry forest margins, lower valley slopes, xerophytic scrub woodlands near coast.

PHOENIX Linnaeus

Phoenix L., Sp. Pl. 2: 1188. 1753.

Small, medium or large, solitary or caespitose, dioecious, armed, pinnate-leaved palms. Caudex straight when solitary or leaning greatly when clustered, with either persistent leaf bases or prominent, raised remains of weathered leaf bases. Leaves numerous; sheath fibrous, disintegrating early; leaf segments induplicate (V-shaped in cross section), regularly arranged, in a single plane, or clustered and inserted at various angles (multifarious), sharply pointed, the segments near the petiole reduced to very stiff elongate spines. Inflorescences interfoliar, usually several at one time, once-branched; peduncle elongate, arcuate, strongly compressed, bearing a single, compressed, bicarinate, caducous primary bract; rachis very short or lacking, the branches fasciculate. Flowers numerous, unisexual, solitary, sessile; staminate and pistillate about equal in size, but on different plants. Staminate flowers oblong to ovoid; calyx cupular, usually tridentate; petals obliquely acute, oblong to ovate, valvate, shortly connate basally, greatly exceeding the calyx; stamens 6, filaments connate basally, anthers linear-oblong, erect, dorsifixed. Pistillate flowers globose; sepals connate in a 3-lobed cupule; petals rounded, concave, broadly imbricate; ovary 3-carpellate, apocarpous, stigmas exerted, recurved. Fruit oblong, terete, 1-seeded, with apical stigmatic remains; mesocarp fleshy; endocarp thin-membranaceous; seed linear-oblong, deeply grooved; endosperm ho-

monogeneous; embryo dorsal or subbasal. Seedling leaves narrowly lanceolate. Chromosome number $n = 18$.

TYPE SPECIES: *Phoenix dactylifera* L.

About a dozen species of tropical and subtropical Africa and Asia.

In the West Indies, plants occasionally spontaneous from cultivation. *Phoenix dactylifera* L., *P. reclinata* Jacq., *P. sylvestris* Roxburgh, *P. roebelenii* O'Brien, and *P. rupicola* Anders. are all widely cultivated and have been reported from the Lesser Antilles. *Phoenix spinosa* Schum. (= *P. reclinata* Jacq.) was reported from Antigua by Grisebach (Fl. Br. W. Ind. Isl. 513. 1864).

RAPHIA Palisot de Beauvois

Raphia P. Beauv., Fl. d'Oware 1: 75-78. 1806 ('1804'); Becc. in Webbia 3: 27-130. 1910; Russell in Kew Bull. 19: 173-196. 1965. FIGURE 70.

Syn.: *Sagus* Gaertner, Fruct. & Sem. 1: 27. 1788, non Steck, 1757.

Large, solitary or clustering, erect, armed, hapaxanthic palms; caudex tall or absent, usually obscured by persistent leaf bases. Leaves pinnate, 6-15 m. long; sheaths strongly fibrous; petiole obscure; segments reduplicate, dark green and shining adaxially, slightly waxy abaxially, armed with fine to coarse teeth along the upper surface of the midrib and on the margins. Species monoecious. Inflorescence terminal, variously branched, the branches obscured by numerous sheathing and overlapping bracts, the bracts being progressively smaller right up to the ultimate branchlets. Flowers strongly dimorphic, solitary in the axils of the bracts along the ultimate branchlets, the pistillate flowers usually arranged along the basal portion of the branchlets, the staminate flowers arranged distally. Staminate flowers each with a persistent, encircling, cuplike, bicarinate bracteole; calyx cuplike, obscurely 3-lobed; corolla with 3 valvate petals connate basally; stamens varying from 6 to 20 or more, the filaments variously connate, and adnate to the corolla, anthers bilocular, sagittate, basifixed. Pistillate flowers each with two persistent bracteoles, the outer not completely enveloping the flower, the inner much shorter, cuplike; calyx undivided to slightly lobed forming a tube which completely encloses the corolla; staminodial ring variously lobed and adnate to the corolla tube; ovary with a short, conical style and stigmatic region. Fruit ovoid or turbinate, entirely covered by glossy, overlapping, basally directed, chestnut- or mahogany-colored, scalelike plates and terminating abruptly in a beak-like projection; the mesocarp oily and soft when mature. Seed one per fruit; endosperm ruminant.

LECTOTYPE SPECIES: *Raphia vinifera* P. Beauv. [Jumellé in Humbert, Flore de Madagascar et des Comores 30: 14. 1945.]

About ten to twenty species distributed in swamps or wet ground from sea level to about 1500 m. elevation throughout Africa and Madagascar, and a single species (*Raphia taedigera* (Mart.) Mart.) indigenous to the New World.

1. *Raphia farinifera* (Gaertner) Hylander in Lustgarten 31: 91. 1952; Russell in Kew Bull. 19: 187-189, figs. 3B, 5C. 1965, in Hutchinson & Dalziel, Fl. W. Trop. Africa ed. 2. 3(1): 166, figs. 374B, 375C. 1968.

Basionym: *Sagus farinifera* Gaertner, Fruct. & Sem. 2: 186, tab. cxx, fig. 3. 1791.
Type: Tab. cxx, fig. 3.

Syn.: *Sagus vinifera* of Duss, Fl. Phan. Ant. Fr. 490. 1897, non Persoon, 1807.

Solitary palms with leaves rising directly from the ground or from a short obscure caudex. Inflorescence curved, branching to form numerous hanging branches; secondary inflorescence branches with a large, triangular bract partially concealing the shorter more compact ultimate branching system; bracts light brown on the outside, deep mahogany and glossy on the inside; ultimate branchlets slender, tan, shiny, crowded in close ranks more or less in one plane, each about 10-14 cm. long. Flowers distichously arranged. Staminate flowers ca. 8 mm. long, each with an encircling, persistent, cuplike, bicarinate bracteole, with a deep sinus on one side; calyx cuplike, truncate, scarcely indented, $\frac{1}{3}$ as long as the corolla; corolla lobes valvate, connate basally; stamens 6, the filaments thickened, angular, connate for more than half their length and adnate basally to the corolla forming a solid stipelike column, anthers deeply sagittate, basifixed. Pistillate flowers 5-8 mm. long, with a bicarinate, persistent, perianthlike outer bracteole half-enclosing a thin, membranaceous, deeply incised, cuplike inner bracteole which completely encircles the basal $\frac{1}{3}$ of the calyx; calyx an undivided tube exceeding and completely enclosing the shorter, sharply tridentate corolla; staminodial ring with up to 6 short deltoid points, adnate to the corolla tube; ovary exceeding the calyx slightly, covered with minute rounded scales. Fruit at maturity top-shaped to obovoid, 5.5-8.5 cm. long, 3-5 cm. wide, with rounded apex ending abruptly in a short beak 3-4 mm. long; scales in (9-)10-11(-12) vertical rows, convex with narrow median groove, chestnut or hazel to mahogany-colored, darker at the point. Seed ellipsoid, solitary, variously ridged and furrowed; endosperm with deep and narrow ruminations. Seedling leaf pinnately divided. Chromosome number unknown.

GENERAL DISTRIBUTION: Africa, Madagascar.

DISTRIBUTION IN LESSER ANTILLES: An early introduced species commonly found in Martinique(!) and less commonly in Guadeloupe(!).

COMMON NAMES: Sagouier, palmier-sagou (Mart.).

HABITAT: Coastal lowlands, along river courses.

PSEUDOPHOENIX Wendland ex Sargent

Pseudophoenix H. Wendl. ex Sarg. in Bot. Gaz. 11: 314. 1886; Read in Gent. Herb. 10: 169-213. 1968.

FIGURE 71.

Medium to large, solitary, erect, unarmed palms; caudex gray to gray-green, waxy, often ventricose (slender in *P. sargentii*), distinctly banded with leaf scars. Leaves pinnate, the sheaths waxy, glaucous gray-green, splitting opposite the petiole, abscissing cleanly; petiole deeply concave above, convex below, with rusty-brown scales only along the margin; segments inserted in groups of 2-6, along the lower half of the rachis at various angles, those toward the apex more regularly spaced and lying flat, the basal segments greatly reduced and crowded, the lowermost pair having marginal deciduous scales like those of the petiole, the segments strongly complicate at the base, often closing over tufts of dark-brown scales attached to the midvein, adaxial surface dark green, often waxy-glaucous, with 1-5 prominent veins, abaxial surface lighter in color, with many minute corrugations, each segment with a pulvinus at the acute angle of insertion. Inflorescence interfoliar, 3 or 4 times branched, arching among the leaves or pendulous; peduncle flattened, strongly fibrous, the first and second nodes with large, ancipitous, leathery, persistent, chlorophyllous primary bracts splitting irregularly, their margins normally with large, tufted, brown scales, the first bract normally longer than and completely enclosing the second, the third node frequently with a short collarlike bract completely encircling the peduncle, each internode subtended by a greatly reduced acuminate bract; flower scars prominent, elevated. Flowers perfect; flower buds stalked (but not pedicellate), ovoid, green, usually glaucous, each with a minute acuminate bract; each pseudopedicel a constricted elongation of the receptacle and the base of the perianth parts, conspicuous; calyx lobes generally triangular with rounded, apiculate angles; petals 3, valvate, thick, fleshy, concave, ovate, many times longer than the calyx, very shortly connate at the base; stamens 6, in two whorls, the outer whorl more or less adnate to the petals; filaments thin, dilated and frequently connate at the base, forming a short cupule, each uniquely attached to an anther by means of a groove extending one-third the length of the anther, turning at an angle inward toward the center to the point of attachment within a short tube, anthers bilocular, sagittate, dehiscing by a longitudinal slit; pistil conical with 3 septal glands located basally opposite the outer whorl of stamen filaments; stigmas 3, sessile, recurving only for a short period each day but remaining recurved after fertilization; ovary trilocular. Fruit globose or with 2 or 3 lobes (1-3-seeded), waxy-red at maturity, supported by pseudopedicel, persistent perianth, and staminal filaments; endocarp hard, brown, smooth, nearly spherical, penetrated at one end by a woody plug forming a broadly conic or rounded prominence which is pitted at the apex. Seed subspherical, slightly depressed at the raphe, shrinking from the wall of the endocarp on drying; raphe radiating on each side into several flexuous branches which form shallow grooves passing over and around the seed and approaching the embryo; endosperm hard,

white, solid; embryo subbasal, reaching nearly to the center of the seed. Seedling leaf lanceolate, entire.

TYPE SPECIES: *Pseudophoenix sargentii* H. Wendl. ex Sargent, of Florida.

A genus of four species distributed throughout the islands of the northern Caribbean and nearby continental coastal areas bordering the Gulf Stream, from Mexico to Florida, Cuba, Hispaniola, the Bahama Islands, and Dominica.

1. *Pseudophoenix sargentii* H. Wendl. ex Sarg. in Bot. Gaz. 11: 314. 1886; Read in Gent. Herb. 10: 205-211, fig. 19. 1968, in Principes 13: 77, 78, fig. 1. 1969.

Type: Florida, Elliott Key, Apr. 1886, C.S. Sargent s.n.! (holotype, A; isotype, GH).

Small palm 4-8 m. high; caudex normally slender, 34-43.9 cm. in diameter, always enlarged for about 15 cm. at base; internodes about 9 cm. apart, reduced to narrow bands in very tall or old plants. Leaves ascending or drooping, 1.5-3.0 m. long; sheath 15-30 cm. long, 8-20 cm. in diameter; petiole 20-50 cm. long, 3-6 cm. wide at base, 1.5-3 cm. wide at lowest segment; lateral winglike margins of rachis 1-2 mm. wide near middle of blade; outline of leaf oblique at the base; segments stiff, dark green above, gray-green or silvery below, 87-127 on each side of rachis, inserted singly or in groups of 3-5, at divergent angles, the lowermost segments greatly reduced, 7-17 occurring in the first 10 cm.; bases of segments strongly complicate, 1-5 mm. wide between the edges, at base of segment the midrib normally having tufts of dark brown scales. Inflorescence green, compact, divaricate, erect among the leaves and 75-120 cm. long, or projecting among or immediately below the leaves and 90-170 cm. lg, 3 or 4 times branched, all branches at right angles to the main axis or directed back from the apex, ultimate branches 1-5.5 cm. long, 0.8-1.4 mm. in diameter; peduncle 35-75 cm. long; floriferous portion almost as broad as long; outer and inner primary bracts subequal, always shorter than peduncle, splitting only near apex. Flower buds dark green, glaucous, 20-50 per branchlet; pseudopedicel (3.0-)3.5-5.5(-6.5) mm. long, (0.6-)0.9-1.2 mm. in diameter; calyx a triangular cup with apiculate angles; petals spreading or reflexed against pseudopedicel, 3.3-4.6(-4.9) mm. wide, 6.0-6.6 mm. long; stamen filaments cuspidate, 3.3-3.8(-4.0) mm. long, the dilated bases fused to form a very short cupule adnate to the petals. Fruit at maturity globose and 1-seeded, or frequently 2- or 3-lobed and 2- or 3-seeded, the aborted carpels frequently very conspicuous at the base of 1- or 2-seeded fruits; 1-seeded fruits when fresh 1.2-1.7 cm. in diameter; pericarp wrinkled when dry; endocarp subspherical, 0.8-1.2 cm. in diameter. Chromosome number $n = 17$.

GENERAL DISTRIBUTION: Primarily a littoral species distributed through the northern Caribbean from Mexico (the Yucatan Peninsula) and Florida to Mona Island, including Cuba, Hispaniola, the Bahamas, and Dominica.

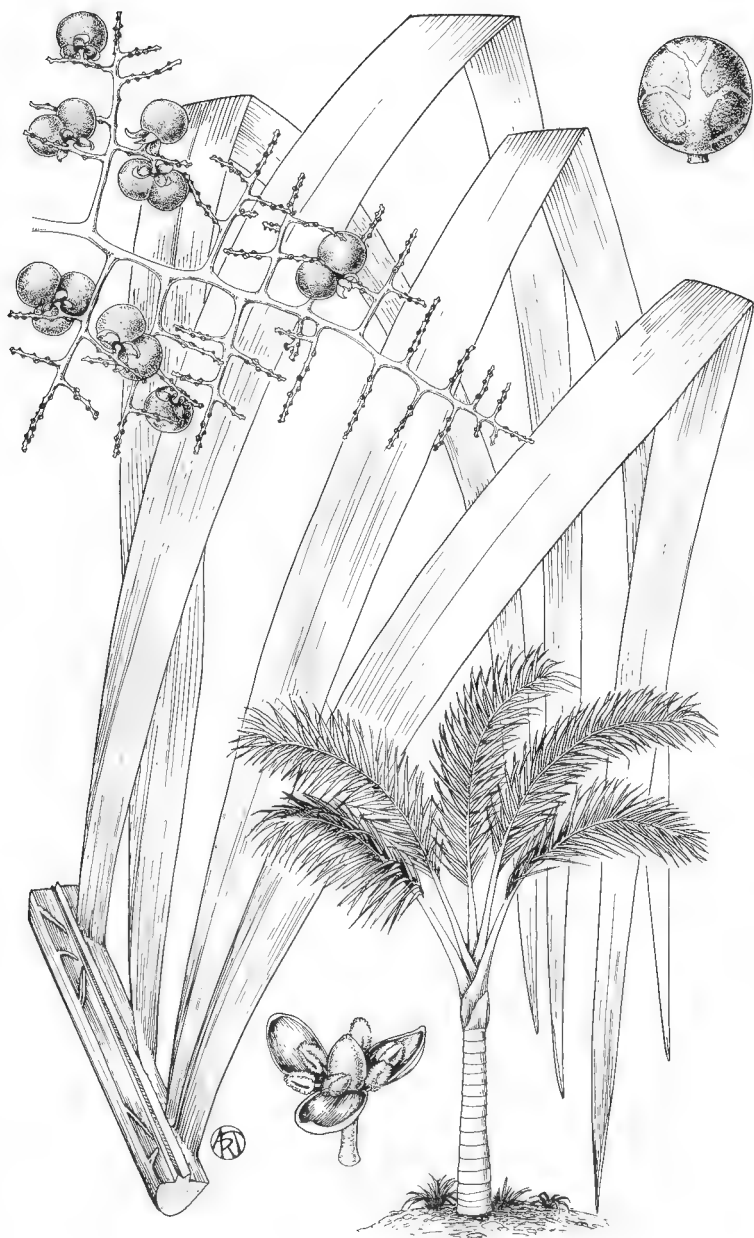


FIGURE 71. Palmae. *Pseudophoenix sargentii*.

DISTRIBUTION IN LESSER ANTILLES: Dominica, Mero, *Read 2008* (us!).

HABITAT: Deciduous dry bushland.

RHYTICOCOS Beccari

Rhyticocos Becc. in *Malpighia* 1: 350, *t.9, fig. 2.* 1887; Drude in Engler & Prantl, *Nat. Pflanzenfam. Nachtr.* 1, 2(3): 56. 1897; Bailey in *Gent. Herb.* 4: 366-372. 1940; Hodge in *Principes* 1: 176-179. 1957; Moore in *Principes* 7: 108. 1963, in *Gent. Herb.* 11: 110. 1973. FIGURE 72.

Tall, unarmed palms; caudex slender, rather straight, more or less swollen at base, free of old leaf bases but prominently ringed with leaf scars. Leaves pinnate; the crown having a vague resemblance to the coconut; sheaths rather long, fibrous; petiole wholly unarmed, rather long and conspicuous, much exceeding the inflorescences; segments acute to acuminate. Species monoecious. Inflorescence interfoliar, bearing two large primary bracts on the stout peduncle; the outer bract leathery and soon caducous, about 35-40 cm. long, thin-edged; the inner bract "woody," exceeding the apical branches, spindle-form, strongly parallel-grooved, splitting on the lower side to release the branches, and becoming hoodlike or boat-shaped, projecting below the leaves in fruit; branches undivided, bearing a few pistillate flowers toward the base, with numerous staminate flowers toward the apex. Flowers strongly dimorphic, in triads of a single pistillate and two smaller staminate flowers each toward the base of the ultimate branches, with staminate flowers paired or solitary throughout the remaining portion, each subtended by small triangular bracts. Staminate flowers with sepals connate basally, imbricate above connation, strongly carinate, with crenulate-serrulate margins on the free spreading apices; petals connate for about $\frac{1}{2}$ their length, valvate above; stamens 6; pistillode trifold, rather short. Pistillate flowers conical in outline in bud; sepals entirely imbricate, nearly equaling petals; petals imbricate for $\frac{2}{3}$ or more their length, with narrowly valvate apices; staminodia 6, connate in a ring and partially adnate to the petal bases; ovary densely woolly tomentose. Fruit like a small coconut, the mesocarp somewhat pulpy and rather fibrous; endocarp of uniform thickness, ellipsoid-obovoid, thick, bony, acute at both ends but not rostrate, with three conspicuous subapical pores, but only a single seed. Seed hollow, terete in cross section and globose with a rugose surface, the testa with 3 narrow, smooth bands; endosperm dry, strongly ruminant, narrowly hollowed in the center. First seedling leaf lanceolate, undivided.

TYPE SPECIES: *Cocos amara* Jacq., now correctly known as *Rhyticocos amara* (Jacq.) Becc.

A monotypic genus endemic to the Lesser Antilles and variously treated as congeneric with *Syagrus*; it is here maintained as distinct on the bases of the tall, slender, clean caudex, the strongly connate petals of the staminate flowers, the woolly tomentose ovary, and the narrowly hollow seed, with strongly ruminant endosperm; also its distribution is isolated, disjunct,

and insular. Retention of the genus *Rhyticocos* is in keeping with the majority of recent treatments.

1. *Rhyticocos amara* (Jacq.) Becc. in *Malpighia* 1: 353, *t.* 9, *fig.* 2. 1887, in *Agric. Col.* 10: 439, 443, 444. 1916; Bailey in *Gent. Herb.* 4: 368-372, *figs.* 230-236. 1940; Hodge in *Carib. For.* 3: 103-109. 1942; Ques-
tel, *Flore Guad.* 1: 149. 1951; Hodge in *Lloydia* 17: 150, 152, *fig.* 78.
1954, in *Principes* 1: 176-179. *figs.* 1957; Beard, *Forest trees of the*
Windward and Leeward Islands 21, 128. 1949. (Unpubl. thesis.)

Basionym: *Cocos amara* Jacq., *Select. Stirp. Amer. Hist.* 1: 277, 278. 1763, as
"*Cocos amarus*."

Type: Martinique. (Specimen unknown.)

Syn.: *Syagrus amara* (Jacq.) Mart., *Palmet. Orbig.* 132. 1847, *Hist. Nat. Palm.*
3: 291, 324, *t.* 166, *fig.* II. 1845; Walpers, *Ann. Bot. Syst.* 1: 1010. 1849;
Griseb., *Fl. Br. W. Ind. Isl.* 522. 1864; Duss, *Fl. Phan. Ant. Fr.* 494. 1897;
Glassman in *Fieldiana Bot.* 32: 215-240. 1970.

Solitary palm, with gray caudex, 10-20 m. tall, 10-20 cm. thick. Leaves
2-3 m. or more long, ragged in appearance as a result of the grouped
segments projecting at more than one angle from the rachis; the crown
somewhat flat across the bottom with the inflorescences conspicuous, hang-
ing down below the leaf bases against the caudex; segments up to 1 m.
long, about 3-4 cm. broad, strongly ribbed, long-attenuate and bifid api-
cally, 30 or more on either side of the rachis, grouped in loose clusters of
2-4, bright shining green, mostly arching to pendent. Inflorescence pen-
dent, 70-100 cm. long, about equaling the petioles, once-branched, with
about 50 branches, the peduncle stout, furfuraceous. Flowers sessile. Stam-
inate flowers ca. 10 mm. long, not pointed in bud, yellow, scented; petals
connate for about 4 mm. from base, valvate above; stamens 6, anthers
strongly sagittate, basifixed on a stout short filament; pistillode trifid.
Pistillate flowers 10-15 mm. long, conical in form; sepals broadly imbricate,
nearly equaling petals; petals 1 cm. or more in length, broadly imbricate
basally like the sepals, but narrowed abruptly to the short valvate apices;
staminodia connate in a broad ring; ovary concial, densely woolly toment-
ose. Fruit orange, 6-7 cm. long, 3-4 cm. broad, ovoid, blunt at both ends.
Seed narrowly hollow, containing a bitter "milk" before fully mature; the
hardened endosperm ruminant, and also bitter. Chromosome number $n =$
16.

GENERAL DISTRIBUTION: Endemic to the Lesser Antilles and Trinidad, in
xerophytic coastal woodlands at the lower altitudes, from sea level to the
mesophytic transition zone at ca. 300 m.

DISTRIBUTION IN LESSER ANTILLES: Montserrat, Guadeloupe!, Dominica!,
Martinique!, St. Lucia!

COMMON NAMES: "Mocho," Moca palm, (Montserrat); Petit coco (Guad.,
Mart.); Palmier amer (Guad.); Petits Cocos des Bois (Guad.); Palmier Rou-
man au Matouba (Guad.); Coconier, "Coconay" (Dominica); Yattahu, "Yat-

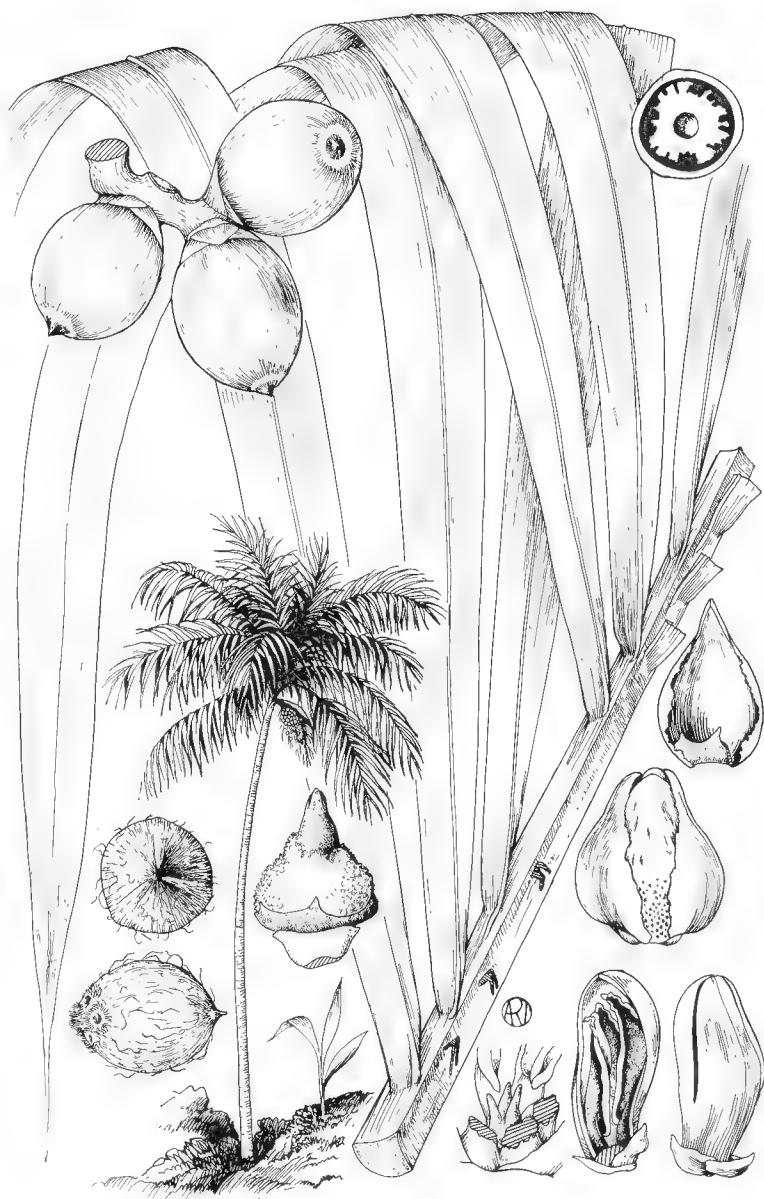


FIGURE 72. Palmae. *Rhyticocos amara*.

tahou" (Dominica); Coco cain (Dominica); Gloughlou (St. Lucia); Overtop palm (general, by L. H. Bailey). Antiquated: Palmiste amer (Mart.).

HABITAT: Xerophytic, scrubby, coastal forests.

COCOS Linnaeus

Cocos L., Sp. Pl. 2: 1188. 1753.

Medium to large, solitary, unarmed, monoecious, pinnate-leaved palms. Inflorescences interfoliar, long-pedunculate, protandrous, the staminate flowers all falling before pistillate are receptive, with two markedly unequal, persistent primary bracts, the outer bract bicarinate, ancipitous, truncate, shorter than the inner bract, the inner bract fusiform (in bud), plicate-grooved (not very obvious when dry), splitting abaxially. Flowers unisexual, both sexes on the same inflorescence, though rarely an inflorescence may be entirely staminate; ovary 3-carpellate, but with only a single carpel normally fertile. Fruit very large; exocarp smooth, green to yellow or orange; mesocarp thick, strongly and densely fibrous; endocarp thick, bony, hard, with three large opercula, normally only one of which covers an embryo; seed large, hollow, containing a large quantity of liquid. Seedling leaf bifid. Chromosome number $n = 16$.

TYPE SPECIES: *Cocos nucifera* L.

A monotypic genus widely cultivated and spontaneous in all the world tropics, especially along sandy coasts; believed to have originated in the Old World tropics.

Cocos nucifera L., Sp. Pl. 2: 1188. 1753; Duss, Fl. Phan. Ant. Fr. 492-494. 1897; Gooding *et al.* Fl. Barbados 86, 87. 1965.

Medium to large palms with the trunk characteristically leaning (but not always), to 30 m. tall, self-cleaning but ringed with broad leaf scars, usually enlarged basally. Leaves arching; the sheath fibrous, netlike, pulling apart from the petiole base as the leaf matures; petiole heavy, greatly swollen basally, concave adaxially, with little or no true free petiolar portion during development, the visible "petiole" is usually what remains after tearing away of the netlike sheathing portion; blade 3-6 m. long, 1 m. or more broad, flexible, lax; segments numerous, lanceolate, 50-70 cm. long, ca. 5 cm. wide, all inserted regularly in a single plane. Inflorescence once-branched, 1-2 m. long, rachis and branches glabrescent, usually minutely punctate-lepidote. Flowers markedly unequal in size and shape, the large pistillate ones usually with associated staminate flowers in triads restricted to the basal portion of each branch, the smaller staminate flowers massed along the apical portion. Staminate flowers 1-1.2 cm. long, paired or solitary, sessile or pedicellate; petals valvate, 1 cm. long, greatly exceeding the sepals; sepals 2 mm. long, free, imbricate basally; stamens 6, anthers sagittate; pistillode prominent, trifid. Pistillate flowers globose-conical, 2.5 cm. long, sepals and petals similar, strongly imbricate; stami-

nodial ring prominent; ovary stout, conic, rather rugose apically, stigmas 3, sessile. Fruit large, ovoid or ellipsoid, bluntly 3-angled, 20-30 cm. long; mesocarp 2-4 cm. thick; embryo basal, opposite one of the pores in the endocarp.

GENERAL DISTRIBUTION: Widely cultivated throughout the world tropics.

DISTRIBUTION IN LESSER ANTILLES: Common on most islands wherever there is or has been human habitation. Occasionally spontaneous along hedgerows, roadsides, and sandy beach areas.

COMMON NAMES: Coconut (all English language areas); Cocotier (Guad., Mart.); Noix de Cocos (Guad.).

EUTERPE Martius, nom. cons.

Euterpe Mart., Hist. Nat. Palm. 2: 28. 1823, emended 3: 165. 1837, nom. cons. (non *Euterpe* Gaertner, 1788, nom. rej.); Moore in Gent. Herb. 9: 256-262. 1963, in Reg. Veg. 34: 54, 55. 1964; McVaugh in Taxon 17: 325, 326. 1968. FIGURE 73.

Syn.: *Catis* Cook in Bull. Torrey Bot. Club 28: 557. 1901. (Type: *C. martiana* Cook, nom. illeg. [= *Euterpe oleracea* Mart.])

Plectis Cook in Bull. Torrey Bot. Club 31: 352. 1904. (Type: *P. oweniana* Cook [= *Euterpe macrospadix* Oersted])

Euterpe sect. *Euterpe* subsect. *Bothrostachys* Burret in Bot. Jahrb. 63: 51. 1929, pro parte.

Euterpe sect. *Euterpopsis* Becc. in Pomona College Jour. Econ. Bot. 2: 352. 1912.

Medium to tall, solitary or caespitose, unarmed palms; caudex gray to white, free of leaf bases. Leaves pinnate, the sheaths smooth, elongate, tubular, forming a usually prominent crownshaft; petioles mostly very short; segments mostly arranged in a single plane, often quite pendulous. Species monoecious. Inflorescence always infrafoliar, once-branched, inserted at the base of the prominent crownshaft; peduncle short, usually stout and bearing two subequal primary bracts; the first bract more or less compressed and ancipitous, inserted close to the second; rachis generally short and somewhat compressed; branches generally erect to spreading at first, then pendulous, not "bulbous" enlarged at base, with dense, white to brown or yellowish, appressed lepidote or velutinous tomentum to glabrescent. Flowers dimorphic, mostly sessile, usually in distinct depressions in the axis, arranged mostly in triads of one pistillate and two staminate, or paired staminate, sometimes with solitary staminate flowers occurring apically; in the triads, pistillate flowers lowermost, subtended by 2 or more prominent, erect bracteoles, the staminate flowers in depressions slightly above, not prominently bracteolate except when pistillate flower absent. Staminate flowers with sepals mostly free, broadly imbricate, rounded to subacute, scarcely keeled; petals valvate; stamens 6, the filaments straight,

not inflexed apically in bud, anthers bilocular, sagittate, pistillode prominent. Pistillate flowers with free, broadly imbricate sepals; petals broadly imbricate basally, very shortly valvate or simply connivent apically, ovary globose, staminodia lacking. Fruit single-seeded, spherical, with conspicuous subapical (to lateral?) stigmatic remains, seed globose; endosperm homogeneous (or ruminant). Seedling leaves pinnate. Chromosome number unknown.

LECTOTYPE SPECIES: *Euterpe oleracea* Mart. (fide Moore in Gent. Herb. 9: 256-260. 1963).

A genus of about 28 species from the Lesser Antilles and Central America, south through Brazil to Peru. A single distinctive species occurs in the Lesser Antilles.

1. *Euterpe dominicana* Bailey in Gent. Herb. 4: 375, 376, f. 237. 1940; Hodge in Carib. For. 3: 107, fig. 3. 1942, in Lloydia 17: 152, 153, figs. 27, 79. 1954; Beard, Forest trees of the Windward and Leeward Islands 126, 127. 1949. (Unpubl. thesis.)

Type: Dominica, Concorde Valley, along Pegoua River, W. H. & B. T. Hodge 3494! (holotype, BH; isotype, GH).

Syn.: *Euterpe hagleyi* ined. [Herbarium name on *Broadway 434* from Grand Etang, Grenada, 12 Mar. 1948.] Nom. nud. Beard, Jour. N. Y. Bot. Gard. 45: 124. 1944; Groome, Nat. Hist. Grenada 104. 1970.

Euterpe grenadana ined. [Herbarium name on *Broadway 434* from Grand Etang, Grenada, 12 Mar. 1948.]

Slender, erect, solitary palms 15-2 m. tall; caudex usually quite straight, obscurely ringed by leaf scars, 30-36 cm. in diameter above a somewhat flaring enlarged basal portion, often producing aerial roots. Leaves rather straight, conspicuously spreading with the segments pendulent; blade 3-5 m. long, light green to yellowish; sheaths 1.5-2 m. long, forming a conspicuous, elongate, tubular crownshaft, exceeding the mature inflorescence bracts in length, glabrescent or with scattered dark scales apically; petiole up to 15 cm. long; petiole and rachis glabrous adaxially, at first densely tan-gray-lepidote abaxially, becoming rapidly glabrescent on exposure; segments about 100-125 on each side of the rachis, each 1-1.2 m. long, 3-5 cm. broad (middle position) with long slender apex, regularly arranged, subopposite, becoming quite pendulous, the adaxial surface glabrous, the abaxial surface with scattered, minute, dark specks; and with margins at first densely tan-gray-lepidote, but rapidly glabrescent on exposure; midrib prominent on both surfaces, adaxially at first densely tan-gray-lepidote, rapidly glabrescent on exposure, abaxially with a line of persistent, large, brown, membranaceous scales. Inflorescences several, infrapetiole, quite erect in bud, shorter than the crownshaft, extending horizontally at anthesis with branches spreading-erect at first, then drooping; peduncle 15-25 cm. long, densely appressed with white to yellowish stellate-lepidote; primary bracts thin, chartaceous, glabrous to glabrescent with only a very few widely scattered scales; rachis 40-50 cm. long, bearing

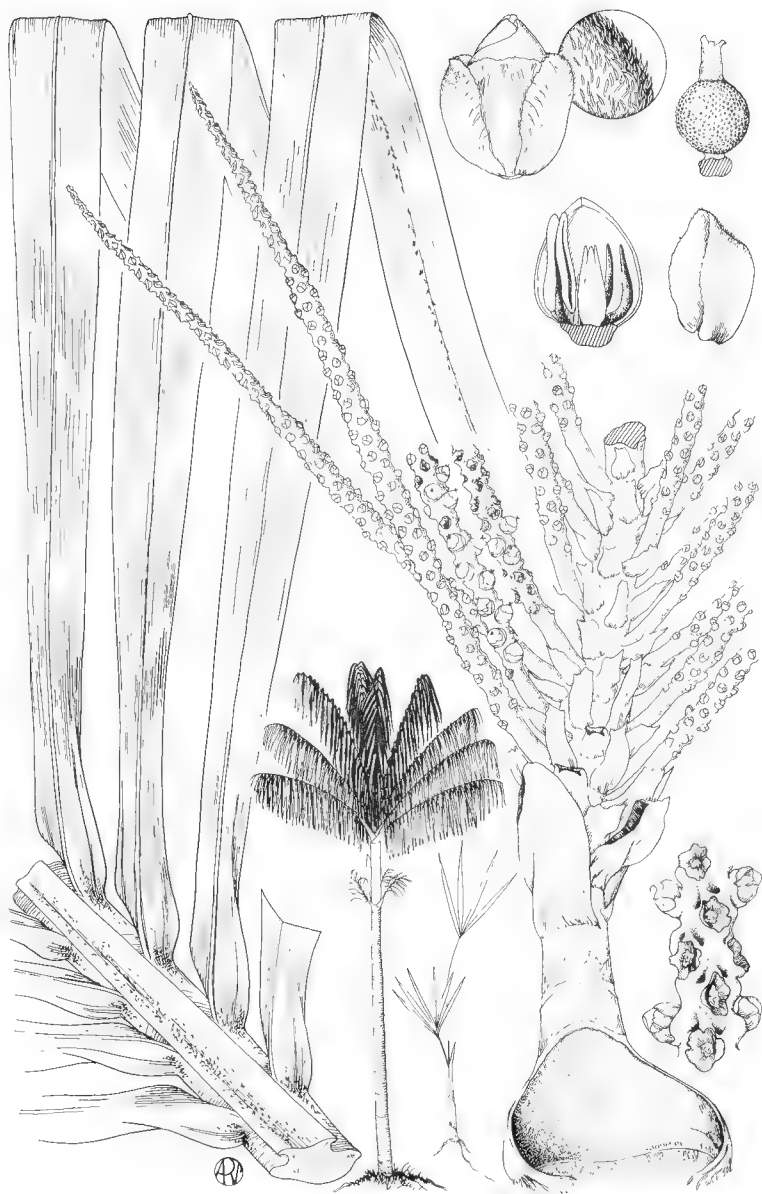


FIGURE 73. Palmae. *Euterpe dominicana*.

80-100 conspicuously pitted branches; branches 40-50 cm. long, 5-8 mm. thick when dry, densely hirtellous with matted stellate pubescence, each of the lower branches often (in Dominican specimens) subtended by a large, triangular bract 1.5-3 cm. long. Flowers mostly crowded, white, deeply set in distinct pits which are enhanced by the depth of the indument surrounding them, mostly in triads on lower portion of branch but paired or solitary staminate apically, with paired staminate flowers occurring throughout, the basipital portion of each pit raised in an obtuse to acute liplike bract. Staminate flowers absolutely sessile with free, subequal, rounded and slightly hooded, strongly imbricated sepals, up to 4 mm. long, with apical portions and membranaceous margins minutely ciliate and pilose-tufted, the outermost sepal slightly keeled, thickened centrally, and overlapping part of each of the other sepals; petals valvate at base and adnate to filaments, more or less triangular, 3.5 mm. long, 3 mm. wide; stamens lavender to purple, the filaments straight apically, scarcely as long as anthers, anthers 3 mm. long, filaments 2 mm. long, versatile; pistillode much shorter than the stamens, triangular in outline with 3 nearly free, acute lobes. Pistillate flowers with sepals free, subequal, rounded-acute, very slightly hooded and rather minutely puberulent apically, margins membranaceous and ciliate, 5 mm. long, 6 mm. wide, the outermost sepal overlapping portions of both the other sepals; petals subequal, slightly longer than sepals, 5.5-6 mm. long, mostly strongly imbricate but valvate apically, minutely puberulent apically, the margins membranaceous and minutely ciliate; ovary stipitate, papillate, with a short, stout tapered style and unequal stigmatic lobes which spread apart when receptive. Fruit 9-15 mm. in diameter and black at maturity, with conspicuous subapical stigmatic remains and persistent perianth; seed 7-11 mm. in diameter, with a conspicuous raphe on adaxial side; endosperm homogeneous; embryo basal at base of raphe. Seedling leaf pinnate. Chromosome number unknown.

GENERAL DISTRIBUTION: Primarily a moist forest species apparently endemic to the Lesser Antilles.

DISTRIBUTION IN LESSER ANTILLES: Dominica!, Grenada!, St. Vincent.

COMMON NAMES: Mountain Cabbage (general); Palmiste, Manicol (Dominica); Hagley's palm (Grenada).

HABITAT: Rain forest and montane thicket; river valleys at moderate elevations and throughout the rain forests at higher elevations to about 1000 m.

PRESTOEIA J. D. Hooker, nom. cons.

Prestoeia J. D. Hooker in Bentham & Hooker, Gen. Pl. 3: 899. 1883, nom. cons.; Bailey in Gent. Herb. 4: 382, 383. 1940, 7: 434, 435. 1947; Moore

in Gent. Herb. 9: 261, 262. 1963, in Reg. Veg. 34: 54, 55. 1964;
McVaugh in Taxon 17: 325. 1968. FIGURE 74.

Syn.: *Martinezia* Ruiz & Pavon, Fl. Per. & Chil. Prodr. 148. 1794. (Lectotype: *M. ensiformis* Ruiz & Pavon [Burret in Rep. Sp. Nov. Reg. Veg. 34: 170. 1933].)

Oreodoxa Willd. in Mem. Acad. Roy. Berlin 1804: 34. 1807. (Lectotype: *O. acuminata* Willd. [Klotzsch in Linnaea 20: 448. 1847].)

Acrista Cook in Bull. Torrey Bot. Club 28: 555. 1901. (Type: *A. monticola* Cook [= *Prestoea montana* (Graham) Nichols.].)

Small to medium, solitary or caespitose, unarmed palms; caudex lightly banded with leaf scars. Leaves pinnate, the sheaths tubular to partially open, splitting opposite the petiole, sometimes forming a short, partially open crownshaft, abscissing cleanly; petiole usually elongate; segments regularly inserted in a single plane, spreading or arching. Species monoecious. Inflorescence sometimes interfoliar in bud, becoming infraxillary at anthesis or in fruit, once-branched; peduncle terete or nearly terete, usually elongate, the first and second nodes with large, markedly unequal, deciduous primary bracts, the first bract strongly ancipitous, much shorter than the second, the second terete and rostrate, sometimes inserted some distance above the first; branches glabrous to puberulent or floccose-lepidote, stiffly ascending or divaricate in all directions from a terete axis. Flowers borne superficially on the slender branches, in triads of a single pistillate and two staminate, the pistillate subtended by two, low, explanate bracteoles, the staminate lateral to the pistillate, sometimes visibly bracteolate. Staminate flowers often stipitate, with essentially free, acute, strongly keeled sepals imbricate at the base only; petals valvate; stamens 6, filaments inflexed at the apex in bud; pistillode prominent, various. Pistillate flowers with free, broadly imbricate sepals; petals mostly imbricate except apically where simply connivent or valvate; staminodia present; ovary slightly stipitate; stigmatic remains conspicuous on fruit. Fruit globose, single-seeded, black or deep purple at maturity; seed globose; endosperm ruminant. Seedling leaves bifid. Chromosome number $n = 18$.

TYPE SPECIES: *Hyospathe pubigera* Griseb. & Wendl, now correctly known as *Prestoea pubigera* (Griseb. & Wendl.) J. D. Hooker.

About twenty-eight species distributed throughout the West Indies, Central America (Nicaragua southward), and northern South America (south to Brazil and Peru). One extremely variable species, possibly to be considered as several distinct subspecies following more intensive study, in the Lesser Antilles.

1. *Prestoea montana* (Graham) Nicholson, Dict. 3: 216. 1886, et Mottet, Dict. d'Hort. 4: 319. 1895-1896; Bailey in Gent. Herb. 4: 384, 385, figs. 241-244. 1940.

Basionym: *Euterpe montana* Graham in Curtis Bot. Mag. 67: pl. 3874. 1841; Griseb., Fl. Br. W. Ind. Isl. 517. 1864.

Type: Grenada, *Greville Icon.*, in Bot. Mag. 67: pl. 3874. 1841.

Syn.: *Euterpe oleracea* auct.; Boldingh, Fl. Nederl. W. Ind. Eil. 139. 1913; non Mart.?

Euterpe globosa auct.; Urban, Symb. Antill. 8: 78. 1920; Hodge in Carib. For. 3: 107, 108, fig. 5. 1942, in Lloydia 17: 153, fig. 30. 1954, in Principes 3: 19-23, figs. 8-10. 1959; Beard, Forest trees of the Windward and Leeward Islands 127. 1949 (Unpubl. thesis.); non Gaertn.?

Areca regia sensu Duss, Fl. Phan. Ant. Fr. 488. 1897, non Kunth.

Prestoea gregalis ined. [Bailey herbarium name, on *L. H. Bailey* 433! from Grenada (BH).]

Prestoea sabana ined. [Bailey herbarium name, on *L. H. Bailey* 407! from Saba (BH).]

Small palm usually solitary (caespitose in specimens from Grenada), 3-15(-20) m. tall; caudex 12.5-20 cm. in diameter, swollen toward the base, prominently ringed by leaf scars. Leaves arcuate to straight, the segments rigid, mostly spreading, flat; blade 1-3.5 m. long, dark glossy green; sheaths 30-90 cm. long, forming a short poorly defined crownshaft which about equals the mature inflorescence bract in length, splitting opposite the petiole, fibrous and densely pale lepidote apically, glabrescent with age; petiole 50-75 cm. long, petiole and rachis glabrescent adaxially (occasionally with scattered large scales at first), densely lepidote, with crowded appressed fimbriate-stellate scales, abaxially tardily glabrescent; segments (25-)30-50 on each side of the rachis, each (30-)40-70(-75) cm. long, (2.5-)3-4.5 cm. broad near middle, regularly arranged, subopposite to paired, spreading in a single plane, the adaxial surface mostly glabrous except near the insertion where lightly lepidote but soon glabrescent, the entire abaxial surface dotted with minute scales, the abaxial midrib often with a continuous line of persistent, large, overlapping, dark-membranous, peltate scales, occasionally widely spaced and occurring on lateral nerves as well. Inflorescences two to several, infrafoliar, not erect in bud, about equaling the "crownshaft," the branches strongly divaricate; peduncle mostly (7.5-)10-20 cm. long (30-45 cm. in Dominican specimens), densely pale to dark, stellate, appressed-lepidote; primary bracts leathery (drying woody in texture), inserted (2-)3-5.5 cm. apart on the peduncle (10-20 cm. apart on Dominican specimens), the first (outer) bract glabrescent to scattered brown-lepidote, (9.5-)15-45 cm. long, about half the length of the second, the inner bract 32-90(-100) cm. long, densely matted, appressed, almost velutinous-lepidote; rachis mostly glabrous to glabrescent (but conspicuously lepidote on Dominican material), bearing 25-50 branches; branches (8-)10-50 cm. long, white or deep magenta at anthesis (sometimes when white in flower becoming red in fruit), glabrous to glabrescent (in Dominican specimens, stellate-pubescent basally to granulose-pubescent apically, with all degrees of reduction between), mostly straight, occasionally sinuous, dilated basally to a broad insertion. Flowers white to pink or magenta, subtended by 2 or 3 low bracteoles, mostly in triads, often paired staminate flowers apically on the branches (rarely pistillate flowers paired on Dominican material). Staminate flowers variously stipitate to appar-

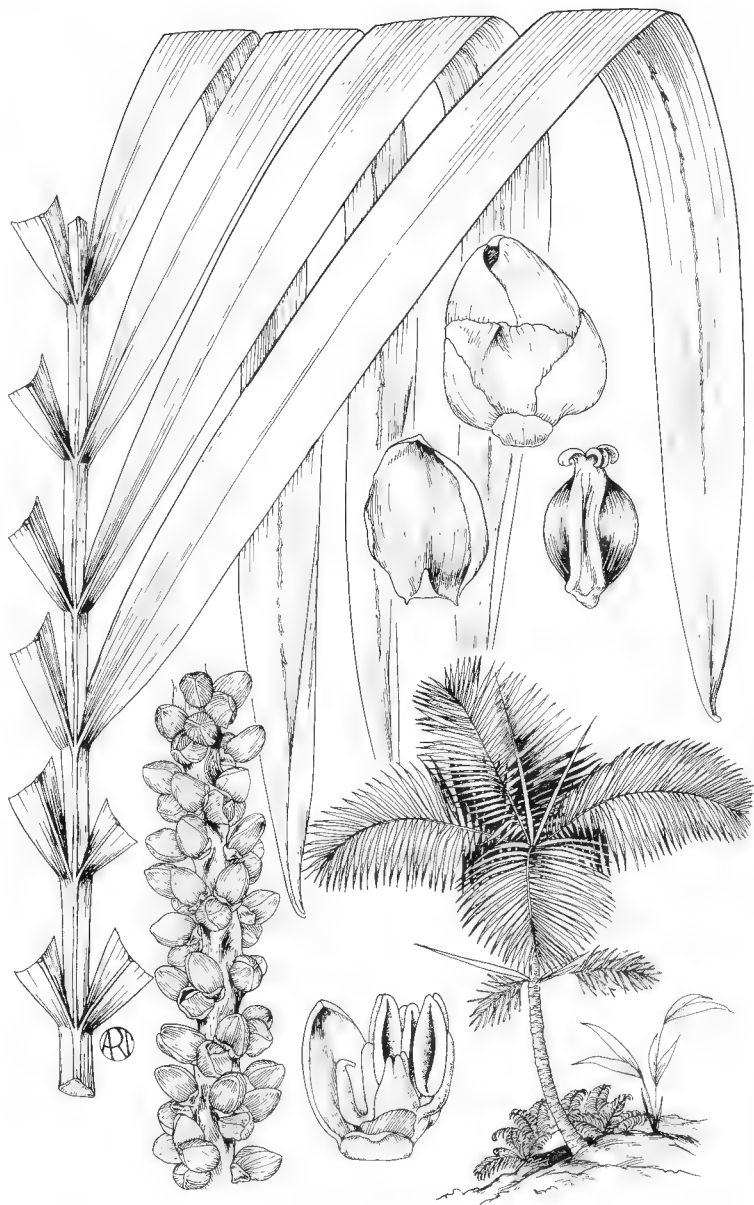


FIGURE 74. Palmae. *Prestoea montana*.

ently pedicellate, the remains of the stalk obvious, extending out from beneath the pistillate flowers and their associated bracts; sepals glabrous, mostly free, generally unequal, 1.2-2 mm. long, 1-2 mm. wide, imbricate only at base, variously keeled, the margins minutely ciliate or serrulate; petals glabrous, valvate, 3-3.5 mm. long, 2-2.5 mm. wide, often oblique at base, acute at apex; stamens white, anthers 1.8-2.5 mm. long; pistillode 1-2 mm. long, ranging from variously columnar with a very shortly trifid, enlarged apex to short, stout, conical, with a long-trifid apex. Pistillate flowers with sepals glabrous, free, subequal, rounded, strongly concave, thickened over much of the middle, ciliate to minutely serrulate, ca. 2.5 mm. long; petals glabrous, broadly imbricate, slightly connivent or scarcely valvate apically, 3-4 mm. long, nearly equal in width, deeply concave, opening only enough to expose the stigmata; staminodia 6, ca. 0.5 mm. long; ovary slightly stipitate, with very short style and 3, short, spreading, blunt stigmata which spread apart when receptive. Fruit 10-12 mm. in diameter with conspicuous, subapical stigmatic remains and persistent perianth; seed 9-10 mm. in diameter with a conspicuous raphe adaxially; endosperm ruminant; embryo basal. Seedling leaf bifid. Chromosome number unknown.

GENERAL DISTRIBUTION: Primarily a montane species distributed throughout the Caribbean from eastern Cuba, Hispaniola, Puerto Rico and the Lesser Antilles to Grenada.

DISTRIBUTION IN LESSER ANTILLES: Saba!, St. Martin!, St. Kitts!, Nevis, Montserrat, Guadeloupe!, Dominica!, Martinique!, St. Lucia!, St. Vincent!, Grenada!.

COMMON NAMES: Mountain Cabbage (Saba, St. Kitts, Nevis, Mont.); Chou Palmiste (Guad.); Palmiste Chou (Dominica); Chou Montagne (Mart., Guad.); Palmiste (St. Lucia); Mountain Palm (St. Vincent, Grenada); Palmiste Montagne (Guad., Dominica, Mart.); Palmiste Rouge (Guad.).

HABITAT: Moist montane forest, above 900 m. elevation; occasionally forming dense pure stands as palm brake.

ROYSTONEA Cook

Roystonea Cook in Science, ser. II, 12: 479. 1900, in Bull. Torrey Bot. Club 28: 547, 549-552. 1901, 31: 349-355. 1904; Bailey in Gent. Herb. 3: 342-363. 1935, 7: 430. 1947, 8: 117-120. 1949; Moore in Principes 7: 163. 1963.

FIGURE 75.

Syn.: *Gorgasia* Cook in Natl. Hort. Mag. 18: 112-115. 1939. (An invalid name, lacking Latin description.) (Type: *Gorgasia maxima* Hughes ex Cook, correctly known as *Roystonea oleracea* (Jacq.) Cook.)

Oreodoxa auct., non Willdenow.

Medium to enormous, solitary, unarmed palms; caudex tan to gray or white, columnar, or variously tapered and swollen, often banded by leaf

scars. Leaves pinnate, usually conspicuously multifarious, dark green; sheaths strongly tubular, forming an immense, elongate, very conspicuous crownshaft, abscissing cleanly; petiole relatively short; segments inserted at various angles, rarely lying flat. Species monoecious. Inflorescence at the base of the crownshaft, much-branched; peduncle short, strongly fibrous, the first and second nodes with large, markedly unequal, caducous, chlorophyllous, coriaceous primary bracts, the outer bract strongly bicarinate, alate, truncate apically, $\frac{1}{2}$ to $\frac{1}{3}$ the length of the inner bract at maturity, the inner bract 1-2 m. long, terete, fusiform, smooth, splitting longitudinally; the branches white at first, prior to exposure embedded in copious, free, farinaceous trichomes. Flowers sessile, unisexual but with prominent pistillode or staminodia, typically in triads of a single pistillate and two lateral staminate, but often with staminate flowers in pairs or solitary toward the apex. Staminate flowers with 3 petals briefly connate basally, valvate above, apically acute; sepals 3, imbricate; stamens usually 6, anthers dorsifixed; pistillode prominent. Pistillate flowers with 3 broadly imbricate sepals; petals 3, valvate; staminodia connate in a crenulate to stellate ring; pistil conical, 3-carpellate, with 3 stigmas, the stigmatic remains conspicuous near the base to one side of the fruit. Fruit less than 2 cm. long, oblong, globose, or curved-pyriform, purplish to nearly black; exocarp very thin; mesocarp soft, moist; endocarp a firm thin shell within which the seed is usually free at maturity, typically 1-seeded; seed slightly depressed, with a branched or lacerated raphe; endosperm white, homogeneous. Seedling leaves lanceolate. Chromosome number $n = 18$.

TYPE SPECIES: *Roystonea regia* (H.B.K.) Cook.

Primarily palms of the lower elevations to sea level, about 10-12 species distributed throughout the islands of the Caribbean, and bordering continental areas such as Florida, Mexico, eastern Central America, and northern South America.

Roystonea oleracea (Jacq.) Cook in Bull. Torrey Bot. Club 28: 554. 1901; Bailey in Gent. Herb. 3: 343-348, 364-369, figs. 191-195, 197-204. 1935, 7: 431, 432, fig. 200. 1947, 8: 120-123. 1949; Moore in Principes 7: 163. 1963. (Ligon, A True & Exact History of the Island of Barbados, 75-79, figs. 1657; Hughes, Natural History of Barbados, 107-111, pl. IV. 1750.)

Basionym: *Areca oleracea* Jacq., Select, Stirp. Amer. Hist. 1: 278 t. 170. 1763.

Type: Caribbean, Jacquin, Icon. t. CLXX.

Syn.: *Oreodoxa oleracea* (Jacq.) Mart., Hist. Nat. Palm. 3: 166. t. 156, f. 1,2, t. 163. 1837; Griseb., Syst. Veg. Karaiiben 111. 1857, Fl. Br. W. Ind. Isl. 517. 1864. *Euterpe caribaea* Spreng., Syst. 2: 140. 1825. (Type: Caribbean, Jacquin Icon. TAB. CLXX.)

Oreodoxa caribaea (Spreng.) Dammer & Urban in Symb. Antill. 4: 129. 1903.

Roystonea caribaea (Spreng.) Wilson in Bull. N. Y. Bot. Gard. 8: 385. 1917.

Gorgasia maxima Hughes ex Cook in Natl. Hort. Mag. 18: 112, 113. 1939.

(An invalid name, lacking Latin description.) (Type: Barbados, *Palma maxima* of Hughes.)

Enormous, stately palm; caudex 25-40 m. tall, columnar, normally straight or slightly tapered, 40-60 cm. in diameter, smooth, gray, faintly ringed at first, often slightly enlarged basally, usually on a pedestal or mound of numerous exposed roots under normal forest conditions. Leaves ascending to widely spreading, the lowermost usually quite horizontal in appearance, 3-6 m. in length, 2 m. broad near the mid-portion, the apex drooping slightly; crownshaft very conspicuous, 2-5(?) m. long, often swollen at the base, smooth, vivid green; petiole short, obscure; segments about 100 or more, 50-100 cm. long, 5 cm. wide, elongated lanceolate, long-attenuate, irregularly apically bifid, arching, subopposite, glabrous, usually glossy, inserted in a single row on the rachis but alternately positioned at two angles, appearing nearly flat but not in a single plane except toward the apex (and in juvenile plants), not multifarious as in other species. Inflorescences occurring several at a time, inserted in a circle around the base of the crownshaft, at first erect, becoming horizontal to drooping in fruit; branches strongly divaricate; peduncle short and stout, strongly tapered, primary bracts inserted a short distance apart; branches undulate at first. Staminate flowers 6 mm. long; petals narrowly oblong; stamens 6, very shortly connate basally; pistillode conical, rather prominent. Pistillate flowers with concave, triangular, valvate petals; staminodia 6-9, in the form of a ring with crenate margin, embracing the base of the ovary. Fruit 15-20 mm. long, 9-10 mm. thick, convex on one side, narrowed slightly within the persistent perianth cupule, blunt apically, purple to nearly black at maturity, normally 1-seeded; seed free, 13-15 mm. long; raphe pattern as broad as seed face.

GENERAL DISTRIBUTION: Lesser Antilles, Trinidad, Tobago and Venezuela; widely cultivated also.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe!, Dominica!, Martinique!, Barbados!; cultivated on nearly all of the islands.

COMMON NAMES: Royal Palm (generally throughout the English language areas); Cabbage Palm (Dominica, Barbados); Caribee Royal (found in literature only); Palmier Franc (Guad.); Palmist Franc (St. Barthelemy); Chou Palmiste (Guad., Mart.); Palmeto Royall (Barbados).

HABITAT: Probably an indicator of good soil conditions, most of its natural habitat now cleared for agriculture, from sea level to about 800 meters elevation.

NAME OF UNCERTAIN APPLICATION

Roystonea peregrina Bailey in Gent. Herb. 8: 127, 128, figs. 33, 34. 1949.

Type: Cultivated, Guadeloupe, Basse Terre on the grounds of M. Adrien Questel at Montebello.

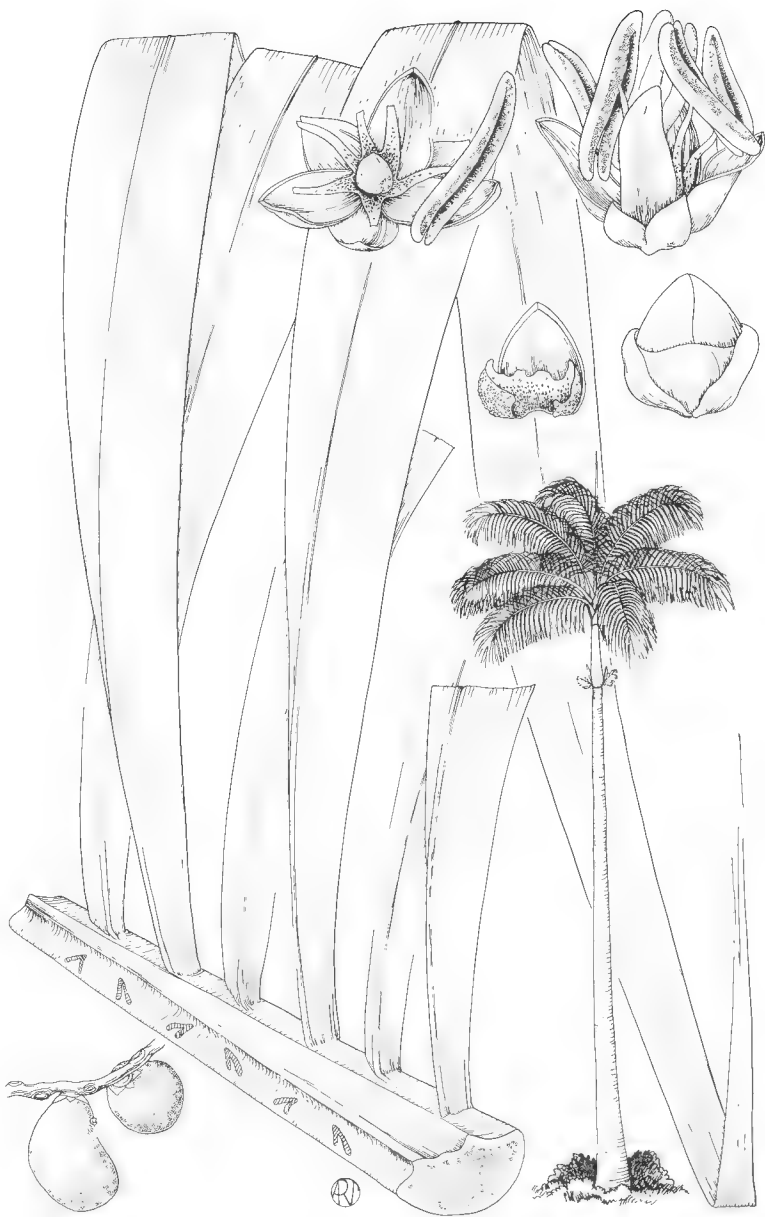


FIGURE 75. Palmae. *Roystonea oleracea*.

The origin of this taxon is unknown, and its true identity and placement will remain uncertain until a monographic treatment of the genus *Roystonea* is completed.

GEONOMA Willdenow

Geonoma Willd., Sp. Pl. 4(1): 174, 593. 1805; Burret in Bot. Jahrb. 63: 144, 145. 1930; Bailey in Gent. Herb. 4: 226, 227. 1939; Wessels Boer, The Geonomoid Palms 82, 83. 1968. FIGURE 76.

Small to medium, solitary or caespitose, unarmed palms; caudex tan to gray, fibrous, obscurely ringed with leaf scars, polelike to rather slender. Leaves pinnately nerved, varying from simple and apically bifid to irregularly or regularly pinnate or jugate; sheaths fibrous, variously lepidote; segments various, from a few paired, broad, multinerved, sigmoid divisions to numerous regularly arranged narrow divisions with but a single principal nerve, or combinations of each on a single plant, often depending on maturity or exposure. Indumentum variously distributed on petiole, rachis, and nerves, varying from simple inconspicuous hairs or irregular masses of scales to large well-defined and conspicuous peltate scales along the major nerves. Species monoecious. Inflorescence inter- or infrafoliar, spicate or variously branched, with 1-3 enlarged primary bracts attached near the base of the peduncle; bracts, peduncle, ultimate branches and flowers variously beset with hairs or scales. Flowers strongly dimorphic, sessile or short-stipitate, in triads of a single pistillate and two staminate flowers each, situated in a pitlike depression on the ultimate branches; the pits usually with an enlarged and often elevated liplike bract covering at least part or all of the pit and also the lower portion of the flowers, sometimes with an additional upper liplike extension present. Staminate flowers with free, imbricate sepals and with petals connate basally but valvate apically; stamens 3 or 6, with free thecae inserted apically on a bifurcate connective; pistillode usually present. Pistillate flowers with sepals free or sometimes united basally, imbricate in bud; petals connate basally, valvate apically; ovary with a basifixed style and 3 spreading stigmatic lobes; the staminal tube cylindrical, surrounding the pistil, often truncate or shortly crenate, or sometimes digitately lobed apically. Fruit globose or ovoid, the mesocarp rather dry, without prominent longitudinal fibers, but with short, more or less radially arranged fibrous strands giving the dry fruit a tuberculate appearance. Seedling leaf bifid. Chromosome number $n = 14$.

LECTOTYPE SPECIES: *Geonoma simplicifrons* Willd. (fide Moore in Gent. Herb. 9: 262. 1963).

A highly polymorphic genus of approximately 100 species distributed throughout the American tropics. Four species are presently thought to occur in the West Indies, with two very distinct species in the Lesser Antilles.

KEY TO THE SPECIES

1. Inflorescence densely puberulose with minute, stiff, spreading hairs; floral pits lacking an upper lip, but densely tomentose within upper portions, the lower lip in most cases entire (except in fruit); stem 3-5 cm. in diameter. 1. *G. martinicensis*
- 1a. Inflorescence granulose, the few scattered hairs rather inconspicuous except under very high magnification; floral pits glabrous within, with two prominent lips, upper and lower, the lower lip in most cases cleft; stem 10-15 cm. in diameter. 2. *G. dussiana*

1. ***Geonoma martinicensis*** Mart., *Palmet. Orbign.* 28. 1847, *Hist. Nat. Palm.* 3: 316. 1853; Griseb., *Syst. Veg. Karaiben* 111. 1857; Urban in *Fedde Rep. Sp. Nov., Beih.* 5: 141. 1920; Burret in *Bot. Jahrb.* 63: 246, 247. 1930; Bailey in *Gent. Herb.* 4: 232, 234, f. 148-150. 1939.

Type: Martinique, Morne de Calebasse, *Plumier*, *Icon. ined. t.* 59-61 (P?).

Syn.: *Geonoma pinnatifrons* Willd. var. *vaga* Burret in *Bot. Jahrb.* 63: 246. 1930; Bailey in *Gent. Herb.* 4: 232. 1939. Excluding ref. to "Griseb. et Wendl." (Lectotype: Dominica. *G. A. Ramage s. n.!* (K).)

Geonoma dominicana Bailey in *Gent. Herb.* 4: 232, f. 147. 1939; Hodge in *Lloydia* 17: 153, t. 80. 1954. (Type: Dominica, Morne Colla Anglais, alt. 610-732 m., 10-23 Aug. 1938, *W. H. Hodge 307!* (holotype, BH; isotypes GH, MASS).).

Clustering palm with 2-10 or more stems of various ages, 2-6 m. tall; stems 3-5 cm. in diameter. Leaf blade irregularly pinnate, broad segments interspersed with narrow linear ones; segments slightly falcate, conspicuously nerved, glabrescent, at first with a few scattered scales; leaf sheath about 30-40 cm. long; petiole 18-60 cm. long; rachis 70-150 cm. long. Inflorescences twice-branched, with 2 subequal, flattened, early decaying primary bracts 10-20 cm. long, inserted about 1-4 cm. apart at the base of the peduncle; the peduncle 21-45 cm. long, flattened, 3-4 mm. thick, 8-12 mm. wide, densely puberulose to glabrescent, pinkish-brown at anthesis, becoming orange-red in fruit; ultimate branches puberulous, the hairs stiff, spreading, mostly 0.1-0.2(-0.3) mm. long, most dense in axils of branches and in upper portion of flowerpits; hairs in pits and axils of branches not conspicuously forked (except on close examination), those in the pits blending gradually into those of the branch surface. Flowerpits spirally arranged, about 2 mm. apart, lower portion of the pit an enlarged, rounded, liplike flap, often with a thin, entire margin, occasionally splitting in fruit (generally quite elevated when dry); upper pit region not clearly defined in the absence of hairs; pit interior densely tomentose, the hairs often darker, denser, but grading gradually into a triangular depression. Staminate flowers with anther thecae sharply reflexed from the filament apex; sepals ca. 2 mm. long, variously keeled and angled, the margins minutely ciliate or serrulate apically; pistillode present within the base of the funnellform staminal tube. Pistillate flowers 3.0-3.5 mm. long; sepals 2.0-2.2 mm. long,



FIGURE 76. Palmae. *Geonoma martinicensis*.

variously keeled and minutely ciliate; petals 2.5 mm. long, shortly adnate to the base of the staminodial tube; staminodial tube minutely crenulate to denticulate apically. Fruits black, ovoid or subglobose, 8 mm. long by 7 mm. wide, slightly pointed apically, somewhat stipitate basally, with persistent perianth parts. Seed subglobose, 5 mm. in diameter. Chromosome number unknown.

GENERAL DISTRIBUTION: Endemic to the Lesser Antilles.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe!, Dominica!, Martinique!, St. Lucia!, St. Vincent!.

COMMON NAMES: Aile a ravet (Mart.?); Goglette (Mart., St. Lucia); Yanga (Dominica); Goblet or Goblett (St. Lucia).

HABITAT: Moist forest at middle elevations.

2. *Geonoma dussiana* Becc. in Fedde Rep. Sp. Nov. 16: 436. 1920; Questel in Geogr. Gen. Guad. Dep. 149. 1951.

Type: Guadeloupe, Bois du Nez Cassé, 28 February 1904, *Duss 4198!* (lectotype US; isotypes F, GH, LE).

Syn.: *Geonoma hodgeorum* Bailey & Hodge in Hodge in Carib. For. 3: 108, f. 6. 1942; Hodge in Lloydia 17: 153. 1954. (Type: Dominica, Morne Trois Pitons, 1400 m., 23 February 1940, W. H. & B. T. Hodge 1430! (holotype, BH; isotypes, GH, NY, MASS).)

Geonoma vaga Duss, Fl. Phan. Ant. Fr. 491, 492. 1897, non Griseb. & Wendl.

Solitary (or "caespitose," Becc.) palm, 4.5-6 m. tall; stem 10-15 cm. in diameter. Leaf blade irregularly pinnate, broad segments interspersed with narrow (often multinerved) linear ones; segments crowded, slightly falcate, conspicuously nerved, at first beset with numerous scurfy, pale, peltate scales along the major nerves; leaf sheath about 30 cm. long; petiole very short or up to 27 cm. long; rachis ca. 10-20 cm. long. Inflorescences twice-branched, 40-50(-80) cm. long, with 2 subequal, flattened, early decaying primary bracts 16-22 cm. long, 2-4 cm. wide, inserted 1.7-2.7 cm. apart at the base of the peduncle; peduncle 15-21 cm. long, flattened, 1.1-2.4 cm. wide, apparently glabrous to granulose, but with scattered minute rather inconspicuous hairs; ultimate branches 9-25 cm. long, minutely puberulous, the hairs widely dispersed, mostly 0.1-0.2 mm. in length. Flowerpits 1.4-2.2 mm. wide, spirally arranged, ca. 2 mm. apart, lower portion of the pit an enlarged, rounded, liplike flap, often with a thin, usually notched margin, generally quite elevated (when dry); upper pit margin well defined and exhibiting a second smaller liplike flap or rim, this lip conspicuously dark-brown-ciliate; pit interior glabrous. Staminate flowers with anther thecae sharply reflexed from the filament apex, often coiled or contorted after anthesis; sepals 3.2-4.6 mm. long, variously keeled and angled, unequal in size and shape, the margins minutely ciliate or serrulate apically; pistillode present within the base of the funnellform staminal tube. Pistillate flowers 3.8-4.5 mm. long; sepals 1.9-3.8 mm. long, variously keeled and minutely ciliate, unequal in size and shape; petals 2.4-3.5 mm. long,

shortly adnate to the base of the staminodial tube; staminodial tube minutely crenulate to denticulate apically. Fruits black, ovoid, somewhat compressed, 8-10 mm. long when dry, with persistent perianth parts. Seed globose, 6-6.5 mm. in diameter. Chromosome number unknown.

GENERAL DISTRIBUTION: Endemic to the Lesser Antilles.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe!, Dominica!, Martinique!.

COMMON NAMES: Coco Macaque, Aile à ravet (Mart.).

HABITAT: Moss-clad montane forests.

CYCLANTHACEAE

CYCLANTHACEAE Dumortier, Anal. Fam. 65, 66. 1829.

Perennial, stout herbs, acaulescent or climbing with adventitious roots. Leaves distichous, sheathing at the base, petiolate, the blades bifid, flabelliform or entire, 1- to 3-costate. Inflorescences axillary, stalked, subtended by 2-11 conspicuous spathes, monoecious, densely crowded. Staminate and pistillate flowers in spirally arranged groups (of one pistillate flower surrounded by 4 staminate flowers) or in alternate whorls; staminate flowers with cuplike perianth, the stamens numerous, the filaments connate and swollen at the base; pistillate flowers coalesced into cycles or free, the tepals 4, free or connate, becoming enlarged in fruit, the staminodes 4, contorted and filiform, the ovary 4-carpellate, each 1-celled, 1-ovulate. Fruit a fleshy syncarp or united or separate berries, often falling from spadix in sheets of pulp; seeds numerous.

TYPE GENUS: *Cyclanthus* Poiteau.

A tropical American family of 11 genera and 180 species. For more information, see G. Harling, Monograph of the Cyclanthaceae, in Acta Hort. Berg. 18: 1-428. 1958; R. A. Howard, Nomenclatural notes on some Lesser Antillean Monocotyledoneae, in Jour. Arnold Arb. 60: 290-301. 1979.

KEY TO THE GENERA

1. Staminate and pistillate flowers in spirally arranged groups; leaf blades deeply bipartite, flabelliform, or entire when mature. *Asplundia*
- 1a. Staminate and pistillate flowers arranged in separate, alternating whorls around the spadix; mature leaf blades deeply bipartite. *Cyclanthus*

ASPLUNDIA Harling

Asplundia Harl. in Acta Hort. Berg. 17(3): 41. 1954. FIGURE 77.

Stout, climbing herbs with elongate stems or terrestrial herbs with short stems. Leaves scattered, petiolate; blades bifid, 1- to 3-costate, plicate, the segments oblong, lanceolate or ovate, acute or acuminate, often split. In-

florescence pedunculate; spathes 3-8, scattered, lanceolate to ovate; spadix ellipsoidal, ovoid or cylindrical. Flowers spirally arranged, in unisexual groups; staminate flowers funnel-shaped, the perianth lobed, the stamens few to many; pistillate flowers usually connate, the tepals developed, the styles conrescent or free. Seeds oblong to ovate, flat, unsculptured.

TYPE SPECIES: *Asplundia latifolia* (R. & P.) Harling, based on *Carludovica latifolia* Ruiz & Pavon.

A Central and tropical South American genus of 82 species.

KEY TO THE SPECIES

1. Plants epiphytic and climbing; leaf blades unicostate; staminate flowers symmetrical. *A. rigida*
- 1a. Plants terrestrial, stems relatively short; leaf blades tricostate; staminate flowers asymmetrical. 2
2. Lowermost spathe less than 9 cm. long, apex acute. *A. insignis*
- 2a. Lowermost spathe 12-20 cm. long, apex long acuminate. *A. dussii*

Asplundia dussii Harl. in Acta Hort. Berg. 18: 226. 1958.

Type: Guadeloupe, *Duss 3804* (holotype, NY!).

Syn.: *Carludovica insignis* sensu Duss, Fl. Phan. Ant. Fr. 485. 1897, in part.

Terrestrial plant with erect stems. Leaves with petioles 35-60 cm., blades 35-45 cm. long, bifid to one-third the length of blade, the segments ovate, 8-14 cm. broad, apex acute, tricostate. Peduncle 12-20 cm. long; spathes 4, the lowermost 12-20 cm. long, 2-3 cm. wide, lanceolate, long acuminate; spadix subcylindrical to ellipsoidal, 4-6 cm. long in flower, 12 cm. long in fruit.

GENERAL DISTRIBUTION: Endemic to the Lesser Antilles.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe!, Martinique!.

COMMON NAMES: Sequine bâtard, langue à boeuf, aile à mouches, cachibou.

Asplundia insignis (Duchassaing ex Griseb.) Harl. in Acta Hort. Berg. 17(3): 42. 1954; 18: 224. 1958.

Basionym: *Carludovica insignis* Duchassaing ex Griseb., Fl. Br. W. Ind. Isl. 513. 1864.

Lectotype: Guadeloupe, *Duchassaing s.n.* (P).

Syn.: *Carludovica palmata* Griseb. in Abh. Ges. Wiss. Göttingen 7: 259. 1857, non Ruiz & Pavon.

Carludovica caribaea Cowell in Torrey 3: 303. 1903. (Type: St. Kitts, Britton & Cowell 326 (NY!).)

Terrestrial plant with stems erect but not climbing, to 60 cm. tall. Leaves with petioles to 1 m. long, blades 50-110 cm. long, bifid for ¼ to ½ its length, the segments 10-17 cm. broad, ovate, acute at apex, tricostate.

Peduncles 10–15 cm. long; spathes 4, the lowermost broadly lanceolate to ovate, 5–6 cm. long, 2.0–2.5 cm. wide, white, apex acute to subacuminate; spadix subcylindrical, in flower 3–4 cm. long, in fruit to 8 cm. long.

GENERAL DISTRIBUTION: Endemic to the Lesser Antilles.

DISTRIBUTION IN LESSER ANTILLES: St. Kitts!, Montserrat!, Guadeloupe!, Dominica!, Martinique!, St. Vincent!, Grenada!.

COMMON NAMES: Siguine bâtard, langue à boeuf, zelle moches, ailes mouches, cachibou.

Asplundia rigida (Aubl.) Harl. in Acta Hort. Berg. 17(3): 43. 1954; 18: 146. 1958.

Basionym: *Pothos rigida* Aubl., Pl. Guian. 2: 839. 1775.

Lectotype: Guiana, *Surian s.n.* (P).

Syn.: *Carludovica rigida* (Aubl.) Urb. in Fedde Rep. Sp. Nov. 15: 397. 1919.

Carludovica plumerii Kunth, Enum. Pl. 3: 106. 1841. (Type: Martinique, Plumier, Pl. Amer. t. 49.)

Carludovica gracilis Liebm. ex Griseb., Fl. Br. W. Ind. Isl. 513. 1864. (Type: Not indicated.)

Carludovica gracilis Sieb. in Duss, Fl. Phan. Ant. Fr. 484. 1897; Stehlé in Bull. Soc. Bot. France 123: 453. 1976.

Carludovica scandens Cowell in Torreya 3: 103. 1903. (Type: St. Kitts, Britton & Cowell 164 (NY).)

Climbing liana, adhering by adventitious roots. Leaves mostly clustered near stem apex; petioles 15–35 cm. long; blades 35–65 cm. long, bifid to more than half their length or much-divided into segments, linear-lanceolate to narrowly lanceolate, 4–10 cm. broad, acute to acuminate at the apex, uncostate. Peduncle 7–10 cm. long in flower, becoming 20 cm. long in fruit; spathes 5 or 6, long-acuminate, white to greenish white; lower spathes 7–12 cm. long, 1.5–2.0 cm. broad, upper ones smaller; spadix subcylindrical, 3–4 cm. long in flower to 8 cm. long in fruit.

GENERAL DISTRIBUTION: Lesser Antilles, Trinidad, Tobago.

DISTRIBUTION IN LESSER ANTILLES: St. Kitts!, Montserrat!, Guadeloupe!, Dominica!, Martinique!, St. Lucia!, St. Vincent!, Grenada!.

COMMON NAMES: Ailes à mouches, zell mouches, cachibou, seguine.

CYCLANTHUS Poiteau

Cyclanthus Poit. in Mem. Mus. Hist. Nat. Paris 9: 35. 1822. FIGURE 78.

Terrestrial plants, often forming large clumps. Young leaves entire, more or less broadly elliptic, bipartite almost to the base when mature; petiole as long as blade. Peduncle long, slender, shorter than petiole; spathes 4, separated on axis, spadix cylindrical to ellipsoidal; staminate and pistillate



FIGURE 77. Cyclanthaceae. a-c, *Asplundia rigida*: a, leaves clustered near apex of climbing stem, $\times 0.1$; b, inflorescence, $\times 0.3$; c, infructescence, with spathe removed, $\times 0.3$.

flowers in alternating whorls. Fruit a fleshy syncarp; carpels dehiscent on axis, falling first from apex of axis; seeds subglobose to broadly ellipsoidal, long-stalked, the testa with 10-12 longitudinal ridges.

TYPE SPECIES: *Cyclanthus bipartitus* Poiteau.

A monotypic genus, the single species distributed in Central America, tropical South America and the West Indies.

Cyclanthus bipartitus Poiteau in Mem. Mus. Hist. Nat. Paris 9: 35, *pl.* 2, 3. 1822.

Lectotype: *Poiteau s.n.* (P).

Syn.: *Cyclanthus plumierii* Poiteau in Mem. Mus. Hist. Nat. Paris 9: 37. 1822; Stehlé in Bull. Soc. Bot. France 123: 453. 1976. (Type: Poiteau, *pl.* 3, ex Harling.)

Stout herb. Leaves with petioles 40-100 cm. long; blades 40-100 cm. long, the segments 6-16 cm. broad, oblong-lanceolate, commonly falcate, with acute apex. Peduncle 30-60 cm. long; spathes broadly lanceolate, the lowermost 20-30 cm. long, 5-8 cm. broad near the middle, the inner spathes smaller, greenish white to yellowish or reddish; spadix of 24-30 cycles of flowers, 4-10 cm. long, 1.5-2.5 cm. thick.

GENERAL DISTRIBUTION: Central America, South America.

DISTRIBUTION IN LESSER ANTILLES: Martinique!, St. Lucia, St. Vincent!.

DOUBTFUL SPECIES

Carludovica palmata Ruiz & Pavon, Syst. Veg. Fl. Peru. Chile. 291. 1798.

Leaves of this plant are the source of fibers for Panama hats. Specimens were once cultivated in Martinique and Dominica and may persist in cultivation but are not represented by recent collections or reports.

ARACEAE

ARACEAE A. L. Jussieu, Gen. 23. 1789.

Plants fleshy or watery, terrestrial or epiphytic, acaulescent with leaves in a rosette, some with enlarged tuberous basal portions, or with climbing stems, occasionally dimorphic juvenile and adult growth forms, or, in *Pistia*, aquatic and pubescent floating plants with sessile leaves in a dense rosette. Leaves generally petiolate, the petioles conspicuously winged or sheathing at the base and for various distances along petiole, the blades generally thick, subcoriaceous, entire, lobed or parted, occasionally perforate. Inflorescence pedunculate, terminal or axillary; flowers perfect or unisexual, spicate, if unisexual the pistillate flowers at the base of the spadix and the

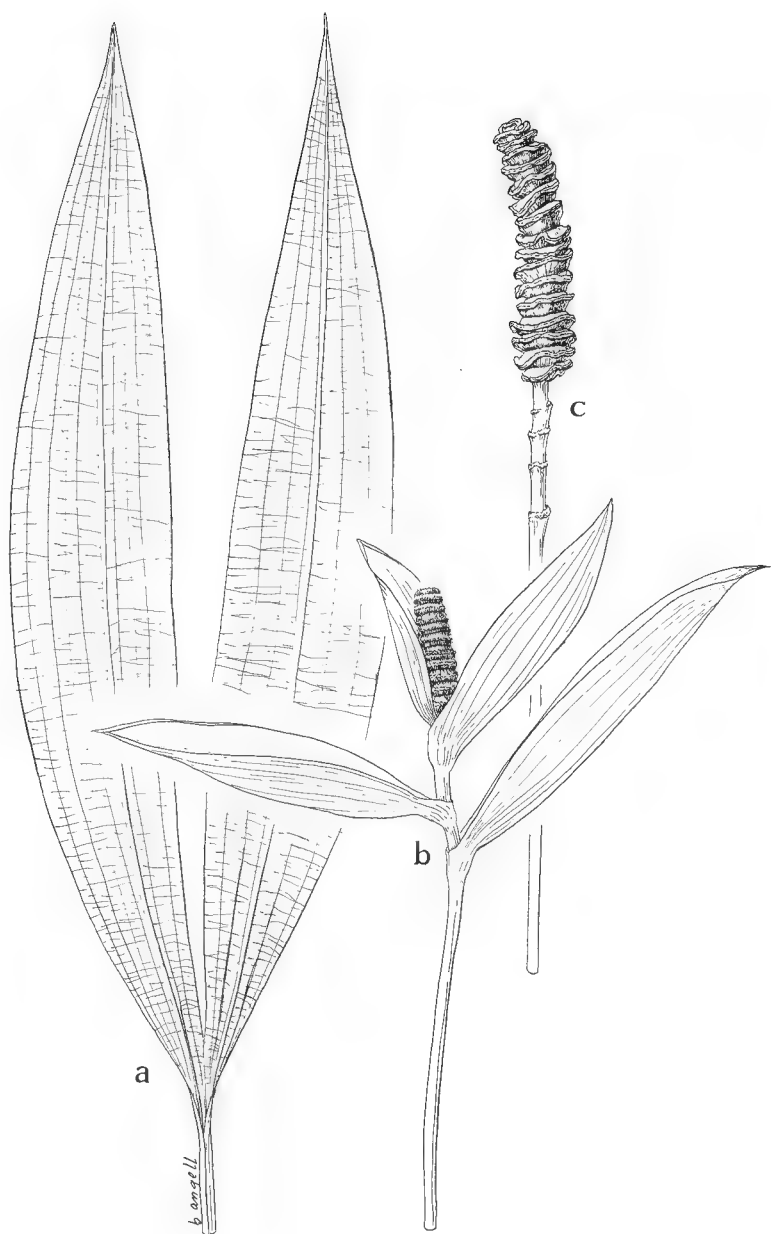


FIGURE 78. Cyclanthaceae. a-c, *Cyclanthus bipartitus*: a, mature bipartite leaf, $\times 0.3$; b, inflorescence subtended by spathe, $\times 0.3$; c, infructescence, with spathe removed, $\times 0.3$.

staminate above, contiguous or separated by sterile flowers; spathe foliaceous, often of thick, fleshy texture, retrorse and free from the spadix, or convolute around the spadix or partially united with it, persistent or deciduous in part or entirely; perianth wanting or of 4-6 segments; stamens 1 to several; ovary 1-several-celled, style absent or short; ovules 1 to many. Fruit a berry, fleshy or woody entirely or at the apex, often aggregate, free or connate, seeds 1 to several.

TYPE GENUS: *Arum* L.

A primarily tropical family consisting of 115 genera and about 2000 species. For further information, see: A. Engler, *Araceae*. *Das Pflanzenreich* IV, vol. 23, parts A, B, D, E. 1905-1930; Howard, R. A. 1979. *Nomenclatural Notes on the Araceae of the Lesser Antilles*. *Jour. Arnold Arb.* 60: 272-289. 1979.

KEY TO THE GENERA

1. Plants floating on surface of water; leaves arranged in a rosette, sessile, spongy and pubescent; spathes to 1.5 cm. long. *Pistia*
- 1a. Terrestrial plants, often epiphytic or climbing; leaves commonly membranaceous, fleshy or coriaceous. 2
2. Leaves peltate; plants with tuberous rootstocks, cultivated or escaped. 3
- 2a. Leaves not peltate. 4
3. Leaves green, rarely spotted; ovules parietal. *Colocasia*
- 3a. Leaves green but spotted or dominated by colored areas; ovules borne on a central placenta. *Caladium*
4. Mature leaves commonly perforated; flowers perfect but lacking a perianth; stamens free. *Monstera*
- 4a. Mature leaves never perforated; flowers perfect or unisexual, perianth present or wanting. 5
5. Spathe spreading or reflexed, not enclosing the spadix and free from it; flowers perfect, perianth present. *Anthurium*
- 5a. Spathe convolute around and tightly investing at least the lower portion of the spadix; flowers unisexual; spadix divided into lower pistillate and upper staminate sections; perianth wanting. 6
6. Climbing plants commonly with adventitious roots, either adhering or sometimes long and free; if terrestrial, plants not of swamp areas and not with swollen bases or thick upright stems; leaves of juvenile shoots distinctive in size and form. *Philodendron*
- 6a. Terrestrial plants with erect stems or acaulescent plants with large leaves and swollen bases. 7
7. Large-leaved plants commonly cultivated or naturalized, rarely flowering, leaves usually exceeding 30 cm.; plants commonly with swollen bases or thick upright stems. *Xanthosoma*
- 7a. Leaves usually less than 30 cm. long; erect, smooth-stemmed plants, usually leafless on the lower portions; native. 8
8. Leaves sagittate; inflorescence terminal, growth sympodial; flowers contiguous on the spadix, free from the spathe. *Montrichardia*
- 8a. Leaves rounded at the base; inflorescence axillary; flowers separated by a sterile portion; spadix partially adherent to the spathe. *Dieffenbachia*

ANTHURIUM Schott

Anthurium Schott, Wiener Zeitschr. Kunst 3: 838. 1829. FIGURE 79.

Terrestrial or epiphytic perennials, subcaulescent or with creeping, climbing or erect stems. Leaves short- to long-petioled; blades variously entire or digitately lobed, usually thick and coriaceous. Peduncles elongate, spathe mostly lanceolate, not enclosing the spadix, often reflexed, deciduous or persistent, green, yellow, whitish or bright red. Spadix sessile or short stipitate, cylindric or conic, many-flowered, flowering from the base to the apex, thickening in fruit. Flowers perfect; perianth segments 4; stamens 4, the anthers longitudinally dehiscent, extrorse; ovary ovoid or obovoid-oblong, 2-celled, the ovules 1 or 2, the style short or wanting, the stigma disclike or oblong, sometimes 2- to 4-lobed. Fruit a red, white or lavender berry; seeds oblong.

TYPE SPECIES: *Anthurium acaule* (Jacq.) Schott, based on *Pothos acaulis* Jacq.

An American genus of approximately 550 species found in tropical continental and insular areas.

KEY TO THE SPECIES

1. Plants scandent, climbing, with elongated stems. 2
- 1a. Plants not climbing, terrestrial or epiphytic with short caudex; leaves commonly in a rosette. 5
2. Leaves deeply divided or lobed. *A. palmatum*
- 2a. Leaves not divided. 3
3. Leaves lanceolate or lanceolate-oblong, 15-30 cm. long, rounded or cuneate at base. 4
- 3a. Leaves ovate in outline, 40-80 cm. long, deeply cordate at base. *A. grandifolium*
4. Plants terrestrial, stems creeping or ascending by twining; spathes whitish, 6 cm. long. *A. willdenowii*
- 4a. Plants epiphytic, stems climbing; spathes green, 1-2 cm. long. ... *A. scandens*
5. Leaves oblanceolate, narrowed at both ends; petiole 2-3 cm. long. *A. martinicense*
- 5a. Leaves ovate, oblong or obovate-oblong. 6
6. Rosette-forming epiphytes; petioles 3-6 cm. long; blades obovate-oblong, the base auriculate to cuneate; veins pinnate. *A. acaule*
- 6a. Terrestrial plant, stems erect, elongate; petioles more than 10 cm.; basal veins arcuate forming a collective vein parallel to the margin. 7
7. Spathe broadly orbicular-ovate, brightly colored. *A. andraeanum*
- 7a. Spathe narrowly lanceolate, green or yellowish. 8
8. Leaf blades cordate-ovate. *A. cordatum*
- 8a. Leaf blades oblong-ovate, the base truncate to shallowly cordate. *A. dominicense*

Anthurium acaule (Jacq.) Schott, Wiener Zeitschr. Kunst 3: 828, 885. 1829.

Basionym: *Pothos acaulis* Jacq., Enum. 31. 1760, Select. Stirp. Am. Hist. 240, t. 153. 1763.

Lectotype: Martinique (?), Plumier, Pl. Amer. t. 51 unmarked plant above fig. i, or Select. Stirp. t. 153. 1763.

Syn.: *Anthurium hookeri* Kunth, Enum. Pl. 3: 74. 1841. (Type: Cultivated plant, Hort. Berol. Herb. Kunth (holotype, B-destroyed).)

Anthurium hookeri var. *longecuneatum* Engler in Bot. Jahrb. 25: 363. 1898. (Type: St. Vincent, H. H. & G. W. Smith 1954.)

Anthurium huegelii Schott, Oesterr. Bot. Wochenbl. 83. 1855. (Type: Described from a cultivated plant.)

Epiphyte with stems short. Leaves rosulate; petioles 2-6 cm. long, stout; blades obovate-oblong, 20-60 cm. long, 12-25 cm. wide, minutely black-dotted, the apex acute, apiculate to cuspidate, the base narrowed or rounded-auriculate, the primary veins arcuate, anastomosing, secondary veins parallel. Peduncle 30-40(-80) cm. long, spathe lanceolate, 7-25 cm. long, 1.0-1.5 cm. wide, acuminate; spadix to 25 cm. long in flower, to 55 cm. long in fruit. Berries obovoid, white, to 1 cm. long.

GENERAL DISTRIBUTION: Lesser Antilles, Trinidad, Guyana.

DISTRIBUTION IN LESSER ANTILLES: St. Kitts!, Nevis!, Montserrat!, Guadeloupe!, Dominica!, Martinique, St. Lucia!, St. Vincent!, Grenada!.

Anthurium andraeanum Linden, Illus. Hort. 24: 43, t. 271. 1877, 27: 382. 1880.

Type: Cultivated plant originally from Colombia.

Terrestrial plant with stems to 1 m. tall, the internodes short. Leaves with petioles 30-40 cm. long; blades commonly reflexed, ovate to ovate-oblong, 18-30 cm. long, 9-15 cm. wide, the apex acuminate or long-cuspidate, the base sagittate, with rounded lobes and narrow sinus. Peduncle often exceeding the leaves, spathe spreading, orbicular-ovate, 8-13 cm. long and as wide, cordate at the base, the lobes often overlapping, puckered, brightly colored; spadix straight or curved, 7-9 cm. long, golden with an ivory or white area.

GENERAL DISTRIBUTION: Native of South America, now widely cultivated.

DISTRIBUTION IN LESSER ANTILLES: Martinique!, St. Lucia!, St. Vincent!.

OBSERVATIONS: Although found in local gardens on many islands, this species, primarily cultivated for the export of cut inflorescences, also persists on plantations. *Anthurium andraeanum* is sometimes regarded as a hybrid or as one of the parents of a large group of named variants selected for their large, showy spathes.

Anthurium cordatum (L.) Schott, Wiener Zeitschr. Kunst 3: 828. 1829.

Basionym: *Pothos cordata* L., Sp. Pl. ed. 2. 1373. 1762.

Lectotype: Probably from Martinique, Plumier, Pl. Amer. t. 38.

Syn.: *Anthurium fallax* Schott, Oesterr. Bot. Wochenbl. 301. 1857. (Type: St. Vincent, Guilding s.n. (K).)

Anthurium commutatum Schott in Bonplandia 10: 148. 1862. (Type: Cultivated plant, origin not stated.)

Anthurium concinnum Schott, Oesterr. Bot. Wochenbl. 301. 1857. (Type: St. Vincent, *Guilding s.n.* (K).)

Anthurium guildingii Schott, Oesterr. Bot. Wochenbl. 301. 1857; Fournet, Fl. Guadeloupe Martinique 419. 1978. (Type: St. Vincent, *Guilding s.n.* (K).)

Anthurium isertianum Schott, Prodr. Syst. Aroid. 493. 1860; Fournet, Fl. Guadeloupe Martinique 420. 1978. (Type: Guadeloupe, *Isert s.n.* (C).)

Climbing, epiphytic plant with extensive supporting roots, occasionally on rocks and erect or sprawling. Petioles of mature leaves 30–50 cm. long; blades cordate-ovate, 25–40 cm. long, 15–24 cm. wide, the apex narrowed and often long-cuspidate, the base cordate, with sinus obtuse to rounded, shallow or deep, and lobes semiovate, overlapping or widely separated, one pair of primary veins conspicuously arcuate-ascending; young leaves ovate to ovate-oblong, 5–16 cm. long, 3–8 cm. wide, the apex long-attenuate, the base rounded or truncate to obtusely cordate. Peduncle to 35 cm. long; spathe lanceolate, 4–6 cm. long, green, the apex long-acuminate; spadix 5–9 cm. long in flower to 20 cm. or more in fruit. Berries red or purplish.

GENERAL DISTRIBUTION: Greater Antilles, Virgin Islands.

DISTRIBUTION IN LESSER ANTILLES: Saba!, St. Kitts!, Montserrat!, Guadeloupe!, Dominica!, Martinique!, St. Lucia!, St. Vincent!.

COMMON NAMES: Hand leaf, queue la rat, petit segune.

Anthurium dominicense Schott, Oesterr. Bot. Zeitschr. 8: 350. 1858.

Type: Dominica, *Imray s.n.* (K).

Terrestrial or rarely epiphytic; stems erect but short. Leaves with petioles 15–35 cm. long; blades oblong-lanceolate to oblong-ovate, 20–40 cm. long, 6–16 cm. wide, the apex acuminate, the base subcordate, truncate or rounded, one pair of primary veins conspicuously arcuate-ascending to the apex. Peduncle 15–40 cm. long; spathe oblong or lanceolate, 2.5–5.5 cm. long, to 1.2 cm. broad, green, the apex acuminate or cuspidate; spadix stout, 4–10 cm. long. Berries subglobose, red.

GENERAL DISTRIBUTION: Puerto Rico, Lesser Antilles.

DISTRIBUTION IN LESSER ANTILLES: Dominica!, Martinique!.

OBSERVATIONS: This taxon is clearly related to *A. cordatum* and might be considered an extreme in variation or a variety or form. Nevertheless, it is clearly recognizable in the field, occurring with typical *A. cordatum*.

Anthurium grandifolium (Jacq.) Kunth, Enum. Pl. 3: 77. 1841.

Basionym: *Pothos grandifolia* Jacq., Coll. 4: 121. 1790.

Type: Caracas, Venezuela, represented by Jacquin, Ic. Pl. Rar. pl. 610.

Syn.: *Anthurium costatum* C. Koch & Bouche, Ind. Sem. Hort. Berol. App. 6. 1853.

(Type: Described from a cultivated plant, location not stated.)

Anthurium cordifolium Kunth, Enum. Pl. 3: 76. 1841. (Type: Cultivated plant represented by *Herb. Willd. 3101*, a juvenile leaf.)

Anthurium hahnii Engler in Bot. Jahrb. 1: 482. 1881. (Type: Martinique, *Hahn 1317* (holotype, B-destroyed, isotype, P).)

Anthurium longispathum Carrière in Rev. Hort. 60: 498. 1888. (Type: Cultivated plant obtained from Guadeloupe.)

Anthurium macrophyllum (Sw.) Schott, Wiener Zeitschr. Kunst 3: 828. 1829.

Pothos macrophylla Sw., Prodr. 33. 1788. (Type: Plumier, Descr. Pl. Amer. t. 63.)

Anthurium wulfschlaegelii Engler in Bot. Jahrb. 25: 434. 1898. (Type: Antigua, *Wulfschlaegel 551* (GOET).)

Climbing epiphytic or rarely terrestrial plant with erect, scrambling stems. Leaves with petiole 20–60 cm. long; blade broadly triangular-ovate, 30–40 cm. long, 20–40 cm. wide, the apex narrowed, cuspidate or acuminate, the base deeply cordate with sinus open or the lobes overlapping. Peduncles as long as or longer than the leaves; spathe linear-lanceolate, 10–35 cm. long, green, the apex long-acuminate; spadix short-stipitate, 25–65 cm. long, brownish-green, usually sterile at the apex. Fruit not recorded.

GENERAL DISTRIBUTION: Greater Antilles, Virgin Islands.

DISTRIBUTION IN LESSER ANTILLES: St. Martin!, Antigua!, Saba!, St. Eustatius!, St. Kitts!, Guadeloupe!, Marie Galante!, Dominica!, Martinique!, St. Lucia!.

OBSERVATIONS: Large, epiphytic, sterile plants seen on Martinique with striate, angular petioles and rugose leaf blades may represent an unnamed species.

Anthurium martinicense Engler in Bot. Jahrb. 1: 480. 1881.

Type: Several collections cited, lectotype not chosen.

Syn.: *Anthurium lanceolatum* sensu auct., including Fournet (Fl. Guadeloupe Martinique 420. 1978).

Epiphytic and saxicolous plants; caudex short. Petioles 4–5 cm. long; blades oblanceolate, 30–35 cm. long, 4–7 cm. wide, apex acute, base cuneate, one pair of primary basal veins ascending as connective vein near the margin. Peduncles to 35 cm. long; spathe lanceolate, 10 cm. long, 1 cm. wide; spadix 8–12 cm. long, 5–6 cm. thick. Berry obovoid, blue-purple in color.

GENERAL DISTRIBUTION: Endemic to the Lesser Antilles.

DISTRIBUTION IN LESSER ANTILLES: Martinique!, St. Lucia.

OBSERVATIONS: Engler (Das Pflanzenr. IV, 23B: 151. 1905) considered *A. martinicense* a synonym of *A. lanceolatum* (L.) Schott and cited the following collections from Martinique: *Belanger 1001*, *Hahn 707*, *1248*, *Duss 2143*, *2144*. The basionym of *Pothos lanceolata* L., Sp. Pl. ed. 2. 1373. 1762,

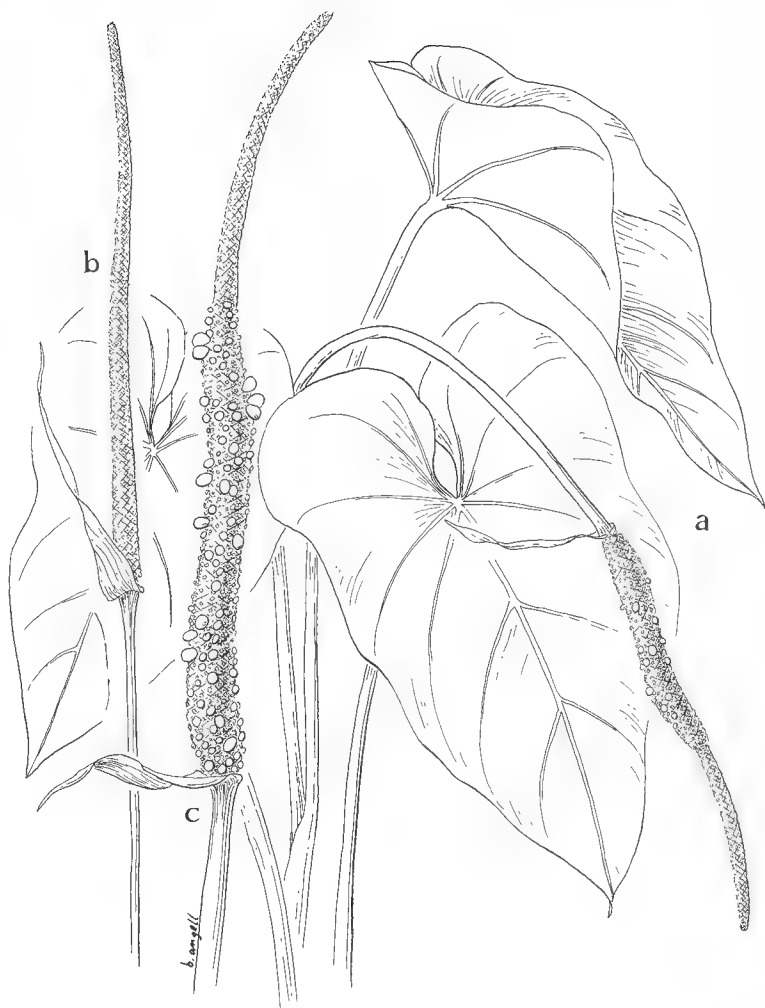


FIGURE 79. Araceae. a-c, *Anthurium grandifolium*: a, habit, $\times 0.2$; b, young inflorescence, $\times 0.5$; c, mature inflorescence with fruit protruding, $\times 0.3$.

is typified by Plumier, Descr. Pl. Amer. plate 62, from a plant said to be from Martinique (Urban in Fedde Rep. Sp. Nov., Beih. 5: 14. 1920). The illustration differs in many significant ways from the specimens cited and in fact is not matched by any recent collections seen. To call attention to the problem, *A. martinicense* Engler is here accepted, and *Pothos lanceolata* L. remains an unplaced species.

Anthurium palmatum (L.) Schott, Wiener Zeitschr. Kunst 3: 828. 1829.

Basionym: *Pothos palmata* L., Sp. Pl. ed. 2. 1374. 1762.

Lectotype: Martinique, Plumier, Descr. Pl. Amer. t. 64, 65.

Syn.: *Anthurium andersonii* Schott, Oesterr. Bot. Wochenbl. 325. 1857. (Type: St. Lucia, Anderson (K).)

Anthurium elegans Engler in Bot. Jahrb. 1: 482. 1881. (Type: Martinique, Hahn s.n. (holotype, B-destroyed, isotype, P.))

Anthurium pentaphyllum (Sims) Kunth, Enum. Pl. 3: 81. 1841. (Basionym: *Pothos pentaphylla* Sims, in Curtis Bot. Mag. 34: t. 1375. 1811, non *Anthurium pentaphyllum* (Aubl.) G. Don.)

Climbing plants, stems exceeding 1 m., with long adventitious roots. Petioles to 1 m. long; mature leaf blade round in outline, 40 cm. in diameter, deeply 5- to 11-parted, the lateral 2 or 3 segments less deeply separated, the segments lanceolate to oblong-lanceolate, broadest above the middle, 20-45 cm. long, 2-11 cm. wide, narrowed at the base, cuspidate-acuminate at the apex; juvenile leaves with petioles 10-20 cm. long, blades ovate-oblong to 12 cm. long, 4 cm. wide or larger, the apex acute, the base obtuse to truncate with 1 or 2 ascending, sharply acuminate lobes. Peduncle 70-80 cm. long; spathe linear-lanceolate, 15-25 cm. long, 1.5-3.0 cm. wide, acuminate; spadix 15-30 cm. long, dark purple in flower. Berries red.

GENERAL DISTRIBUTION: Restricted to the Lesser Antilles.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe!, Dominica!, Martinique!, St. Lucia!

COMMON NAMES: Ciguine, seguine, benefice, mibi.

OBSERVATIONS: The name *Pothos pentaphylla* Sims was illegitimate when published. Although he illustrated a living plant obtained from Trinidad, Sims stated that a specimen from St. Lucia was in the Banks Herbarium.

Anthurium scandens (Aubl.) Engler in Mart., Fl. Brasil. 3(2): 78. 1878.

Basionym: *Dracontium scandens* Aubl., Pl. Guian. 2: 836. 1775.

Type: Haiti, Plumier, Descr. Pl. Amer. t. 74.

Syn.: *Pothos violacea* Sw., Prodr. 32. 1788. (Type: Haiti, Plumier, Descr. Pl. Amer. t. 74.)

Anthurium violaceum (Sw.) Schott, Wiener Zeitschr. Kunst 3: 828. 1829.

Anthurium scandens var. *violaceum* (Sw.) Engler in Mart., Fl. Brasil. 3(2): 78. 1878.

Slender climbing plant, the fibrous sheaths persistent at the nodes. Petioles 1.5-9.0 cm. long; blades narrowly lanceolate to lanceolate-ovate or

oval, 5-14 cm. long, 2-7 cm. broad, the apex acute to acuminate, the base rounded or narrowed. Peduncle 3-5 cm. long; spathe oblong-lanceolate to lanceolate, 1-2 cm. long, with apex acute; spadix 2-5 cm. long. Berries subglobose, pearly white or violet.

GENERAL DISTRIBUTION: Central America, Greater Antilles, South America.

DISTRIBUTION IN LESSER ANTILLES: Antigua, Guadeloupe.

Anthurium willdenowii Kunth, Enum. Pl. 3: 71. 1841.

Type: Cultivated plant represented by *Herb. Willd.* 3095.

Syn.: *Anthurium barbadosense* Engler in Bot. Jahrb. 25: 404. 1898. (Type: Barbados, Eggers 7326 (holotype, B-destroyed).)

Anthurium dussii Engler in Bot. Jahrb. 25: 403. 1898. (Type: Guadeloupe, Duss 3789 (holotype, B-destroyed).)

Anthurium swartzianum Schott, Oesterr. Bot. Wochenbl. 238. 1857. (Type: "Ind. Occ.," Swartz s.n. (s).)

Terrestrial stout-stemmed plant, the stems trailing, ascending when supported. Petioles 5-20 cm. long; blades oblong-lanceolate, 25-27 cm. long, 4-8 cm. wide, the apex acute, short-apiculate, the base narrowed. Peduncle 25 cm. long; spathe linear-lanceolate, 6 cm. long, acuminate; spadix short-stipitate, 10 cm. long, red-purple. Berries white.

GENERAL DISTRIBUTION: Endemic to the Lesser Antilles.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe, St. Lucia, Barbados!.

SPECIES IN CULTIVATION

Anthurium gracile (Rudge) Schott was reported by Duss (Fl. Phan. Ant. Fr. 476. 1897) as cultivated in the St. Pierre Botanical Garden at Fort-de-France. This is incorrectly called *A. scolopendrinum* (Desv.) Kunth by Fournet (Fl. Guadeloupe Martinique 422. 1978).

Anthurium schaezerianum Schott is also reported in cultivation by Fournet (Fl. Guadeloupe Martinique 422. 1978).

CALADIUM Ventenat

Caladium Vent., Descr. Cels. pl. 30. 1801.

FIGURE 80.

Acaulescent herbaceous perennials with swollen tubers and often with rhizomes. Leaves long-petiolate; blades usually peltate and sagittate. Tube of spathe convolute and persistent, constricted at the apex, the blade cymbiform. Spadix shorter than the spathe, stipitate, the flowers monoecious, the staminate above and separated from the pistillate by sterile units; perianth lacking; stamens 3-5, connate, the anthers dehiscent by apical

slits; ovary 2-celled, with numerous ovules, the sessile stigma entire to 4-lobed. Fruit a berry, pyriform or clavate; seeds ovoid.

TYPE SPECIES: *Caladium bicolor* (Aiton) Vent., based on *Arum bicolor* Aiton. A South American genus of 15 species.

Caladium bicolor (Aiton) Vent., Descr. Cels. *pl.* 30. 1801.

Basionym: *Arum bicolor* Aiton, Hort. Kew. 3: 316. 1789.

Type: Cultivated plant from Madeira.

Syn.: *Cyrtospadix bicolor* (Aiton) Brit. & Wilson, Sci. Surv. Porto Rico 5: 126. 1923.

Caladium bicolor forma *rubicundum* (Engler) Stehlé in Bull. Soc. Bot. France 123: 452. 1976.

Caladium bicolor forma *surinamense* (Miq.) Stehlé in Bull. Soc. Bot. France 123: 452. 1976.

Rhizome swollen, depressed-globose. Petioles slender, to 20 cm. long; blades peltate, ovate or triangular-ovate, 12–40 cm. long, 7–30 cm. wide, usually brightly colored and commonly spotted or variegated, the apex acute, the base cordate or emarginate. Flowers rare; spathe white, 7–14 cm. long.

GENERAL DISTRIBUTION: Native of the Old World, but commonly cultivated.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe!, Dominica!, Martinique!, St. Lucia!, St. Vincent!, Barbados!.

COLOCASIA Schott

Colocasia Schott in Schott & Endlicher, Melet. Bot. 1: 18. 1832, nom. cons. FIGURE 81.

Coarse perennial herbs with short, erect caudex and tuberous roots. Leaves long-petiolate, vaginate; blades peltate, ovate- or sagittate-cordate. Peduncles stout, much shorter than the leaves; spathe convolute, persistent and accrescent in fruit. Spadix shorter than the spathe, the flowers unisexual, those of the staminate portion elongate, separated by sterile flowers from the shorter pistillate portion; perianth wanting; stamens 3–6, connate, anthers apically dehiscent by a slit; ovary 1-celled, ovules numerous, the stigma sessile or depressed-capitate. Berries obconic or oblong; seeds oblong.

TYPE SPECIES: *Arum colocasia* L., correctly known as *Colocasia esculenta* (L.) Schott, nom. cons.

An Indomalaysian and Polynesian genus of eight species.

Colocasia esculenta (L.) Schott in Schott & Endlicher, Melet. Bot. 1: 18. 1832.

Basionym: *Arum esculentum* L., Sp. Pl. 2: 965. 1753.

Lectotype: Sloane, Hist. 1: t. 106, fig. 1 (leaf only).

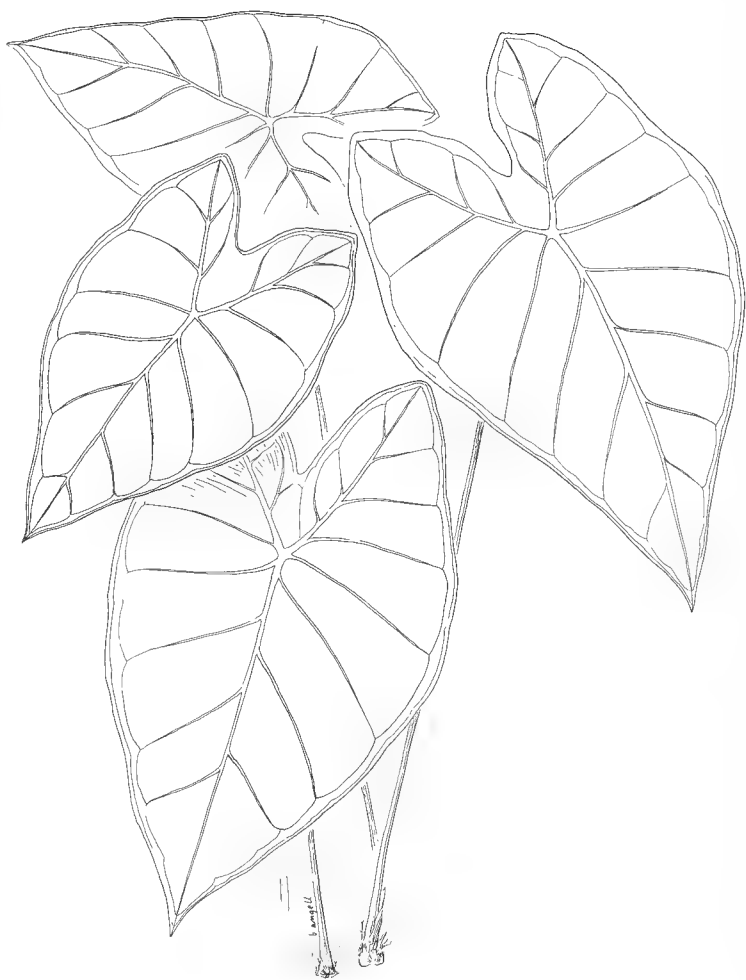


FIGURE 80. Araceae. *Caladium bicolor*, $\times 0.3$.



FIGURE 81. Araceae. *Colocasia esculenta*, $\times 0.3$.

Syn.: *Colocasia antiquorum* Schott in Schott & Endl., Melet. Bot. 1: 18. 1832, a renaming of *Arum colocasia* L. (Type: Not selected from pre-Linnaean references.)

Plant with starchy tuberous rootstock, considerably variable in size; tissues soft, watery. Petioles to 1 m. long; blades ovate-cordate in outline, 30-40 cm. long, 20-30 cm. wide, the apex acute or short-acuminate, the base cordate, with broadly ovate but short-pointed lobes. Flowers rare; peduncles shorter than the petioles; spathe convolute at base, 15-35 cm. long, the free limb 2-5 times the length of the tube. Fruit not known in the Antilles.

GENERAL DISTRIBUTION: Native of tropical Asia, widely cultivated in tropics.

DISTRIBUTION IN LESSER ANTILLES: Antigua!, Guadeloupe!, Dominica!, Martinique!, St. Lucia!; probably cultivated on all islands.

COMMON NAMES: Taro, dasheen, dachine, malanga.

OBSERVATIONS: Many selections of this plant have been introduced and cultivated, and are perpetuated by offshoots of the rootstock. The unrolled leaves are commonly cooked as a vegetable or served in soup as calalu.

DIEFFENBACHIA Schott

Dieffenbachia Schott, Wiener Zeitschr. Kunst 3: 803. 1829. FIGURE 82.

Perennial herbs, usually of wet places, with thick erect or inclined stems and white, caustic, poisonous sap. Leaves borne mostly at or near top of stem; petioles vaginate to half their length; blades lanceolate to oblong or ovate, or obovate-oblong, often spotted or otherwise variegated. Peduncle shorter than petiole; spathe narrowly oblong in the convolute base, the blade generally longer, straight or recurved; spadix erect, the pistillate portion adnate to the spathe, the staminate portion free; flowers functionally unisexual; perianth wanting; stamens 4 or 5, connate; pistillate flowers with clavate staminodes, ovary lobed, with solitary ovules, stigmas sessile, globose or lobed. Fruit a berry; seeds globose.

TYPE SPECIES: *Arum seguine* Jacq., correctly known as *Dieffenbachia seguine* (Jacq.) Schott.

A tropical American and West Indian genus of about 30 species.

Dieffenbachia seguine (Jacq.) Schott, Wiener Zeitschr. Kunst 3: 803. 1829.

Basionym: *Arum seguine* Jacq., Enum. 31. 1760.

Lectotype: Plumier, Descr. Pl. Amer. t. 61.

Syn.: *Dieffenbachia plumieri* Schott, Oesterr. Bot. Wochenbl. II: 69. 1852. (Type: "icone Plumieri Martinique".)



FIGURE 82. Araceae. *Dieffenbachia seguine*, $\times 0.3$.

Stems ascending, erect, to 2 m. tall, leafless except near the top, green. Petioles to 30 cm. long; blades elliptic- to ovate-oblong, 22-40 cm. long, 12-19 cm. wide, the apex acute or acuminate, the base cordate, rarely cuneate, green or variegated with spots or stripes. Peduncle 4-15 cm. long; spathe white. Berries orange-red.

GENERAL DISTRIBUTION: Mexico, Central America, Greater Antilles, South America.

DISTRIBUTION IN LESSER ANTILLES: Antigua!, St. Kitts!, Guadeloupe!, Marie Galante!, Dominica!, Martinique!, St. Lucia!, St. Vincent!, Grenada!, Barbados!.

COMMON NAMES: Dumb cane, canne d'eau, segune, canne brulante.

OBSERVATIONS: *Dieffenbachia maculata* (Lodd.) G. Don (syn: *D. picta* Schott) is commonly cultivated. Fournet (Fl. Guadeloupe Martinique 423. 1978) suggests that several other species and varieties are grown as potted plants.

MONSTERA Adanson

Monstera Adanson, Fam. Pl. 2: 470. 1763.

FIGURE 83.

Scandent epiphytes climbing by adventitious roots. Juvenile plants creeping or climbing, with ovate leaves tightly appressed to the surface, overlapping and covering the flattened stem. Mature plants with distichous leaves; petioles pulvinate at both ends, vaginate at the base; blades ovate to lanceolate, entire, pinnatifid or perforate, the apex acute, the base cordate to cuneate, often oblique. Peduncles short; spathe white, cream or yellow, convolute and hemispheric at base, the blade curved, deciduous; spadix sessile, cylindric, the flowers sterile near the base; flowers perfect; stamens 4; ovary bilocular, with 2 basal ovules in each locule. Berries mostly 1-seeded, often open at apex; seeds globose to oblong.

LECTOTYPE SPECIES: *Dracontium pertusum* L., correctly known as *Monstera adansonii* Schott.

A genus of about 50 species found in tropical areas of the Americas and the West Indies. See also: M. Madison, A revision of *Monstera* (Araceae), in Contr. Gray Herb. 207: 3-100. 1977.

Monstera adansonii Schott, Wiener Zeitschr. Kunst 4: 1028. 1830.

Type: Martinique, Plumier, Descr. Pl. Amer. t. 56, 57.

Syn.: *Dracontium pertusum* L., Sp. Pl. 2: 968. 1753. (Type: Plumier, Descr. Pl. Amer. t. 56, 57.)

Monstera pertusa (L.) DeVries, Hort. Spaarm. Bergens. 1839; Fournet, Fl. Guadeloupe Martinique 415. 1978, non *M. pertusa* (Roxb.) Schott.

Monstera jacquinii Schott, Oesterr. Bot. Wochenbl. 4: 66. 1854. (Type: Jacquin, Hort. Schoenbr. 2: t. 184, 185.)



FIGURE 83. Araceae. a-c, *Monstera adansonii*: a, perforated leaf, $\times 0.5$; b, open spathe and mature inflorescence, $\times 0.5$; c, young fruiting inflorescence and subtending bract, $\times 0.5$.

Monstera imrayana Schott, Oesterr. Bot. Zeitschr. 9: 40. 1859. (Type: Dominica, Imray 330 (K).)

Monstera macrophylla Schott, Prodr. Syst. Aroid. 362. 1860. (Type: Guadeloupe, Perrotet s.n. (holotype, w-destroyed).)

High-climbing epiphyte. Juvenile plants creeping; petiole vaginate for most of its length, blade ovate to narrowly elliptic, entire or perforated, often strongly asymmetrical. Mature leaves with petioles 20-60 cm. long, vaginate or strongly winged for varying lengths; blades broadly ovate to elliptic, 25-70 cm. long, 15-45 cm. wide, apex acute to short-mucronate, base cuneate to truncate, commonly oblique with one side cuneate and the other truncate or subcordate, entire, laciniate, perforations wanting or in one or several series. Peduncle 9-22 cm. long; spathe cream to pale yellow, opening wide at maturity, 8-13 cm. long. Berries deep yellow, open at apex; seed solitary.

GENERAL DISTRIBUTION: Tobago and Trinidad.

DISTRIBUTION IN LESSER ANTILLES: Antigua!, Saba!, St. Kitts!, Guadeloupe!, Marie Galante!, Dominica!, Martinique!, St. Lucia!, St. Vincent!, Grenada!.

COMMON NAMES: Liane percée, seguine-couleuvre.

Monstera deliciosa Liebm. is occasionally cultivated in parks.

MONTRICHARDIA Crueger

Montrichardia Crueger in Bot. Zeit. 12: 25. 1854, nom. cons. FIGURE 84.

Terrestrial, erect plants of swamps and coastal marshes; stems stout, unarmed or with stout scattered prickles, ascending and sympodial after anthesis. Leaves clustered near the apex; petioles vaginate to the middle, clasping at the base; blades sagittate, the lobes and apex acute. Peduncles shorter than the leaves; spathes convolute below, the blade open, deciduous; spadix erect, shorter than the spathe, pistillate portion cylindrical, staminate portion contiguous and longer than the pistillate. Flowers with perianth wanting; stamens 3 or 6, distinct, the anthers dehiscent by apical slits; pistil subprismatic, 1-celled, ovules 1 or 2 per locule. Fruit large, spongy or fleshy but woody and excavate at the apex, 1-seeded.

TYPE SPECIES: *Caladium aculeatum* Meyer, correctly known as *Montrichardia arborescens* (L.) Schott.

A tropical genus of two species occurring in the Americas and the West Indies.

Montrichardia arborescens (L.) Schott, Araceen Betreff. 1: 4. 1854.

Basionym: *Arum arborescens* L., Sp. Pl. 2: 967. 1753.

Type: Plumier, Descr. Pl. Amer. t. 60.

Syn.: *Caladium aculeatum* G. F. W. Meyer, Prim. Fl. Esseq. 274. 1879. (Type: Rodscheid, s.n.)



FIGURE 84. Araceae. a-c, *Montrichardia arborescens*: a, habit, $\times 0.3$; b, mature inflorescence, $\times 0.4$; c, mature cluster of fruit, $\times 0.3$.

Montrichardia aculeata (Meyer) Crueger in Bot. Zeit. 12: 25. 1854.

Montrichardia arborescens var. *aculeata* (Meyer) Engler in Mart., Fl. Brasil. 3(2): 128. 1878.

Stems erect, to 3 m. tall, often swollen at the base to 25 cm. in diameter, unarmed or with short, flattened, woody prickles. Petioles 18–30 cm. long; blades sagittate-ovate, 20–30 cm. long, the basal lobes triangular or ovate-triangular, the sinus broad or narrow or the lobes overlapping. Peduncle stout, to 15 cm. long; spathe 10–12 cm. long, 6–7 cm. wide, white or purplish at the base; spadix thick, staminate portions 7 cm. long, pistillate portion shorter. Infructescence oblong in outline, to 15 cm. long, 10 cm. in diameter. Berries spongy at the base, woody at the apex; seeds oblong.

GENERAL DISTRIBUTION: Central America, Trinidad, South America.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe!, Dominica!, Martinique!, St. Lucia!, St. Vincent!, Grenada!.

COMMON NAME: Malanga sauvage.

PHILODENDRON Schott

Philodendron Schott, Wiener Zeitschr. Kunst 3: 780. 1829, nom. cons.

FIGURE 85.

Stout ascending perennials or slender high-climbing vines, both forms with long adventitious roots. Juvenile plants with smaller leaves; petioles long-vaginate, the sheaths ligulate. Mature plants with long petioles, variously vaginate for part of their length; blades entire, lobed or variously divided and pinnatifid. Peduncles usually short; spathe swollen, convolute below, the base persisting, the blade tightly convolute or becoming retrorse and deciduous, both parts often brightly colored; spadix erect, about equaling the spathe, generally sessile; pistillate portions basal, cylindric to globose, the staminate portion much longer, fertile in the middle, upper and lower portions sterile. Flowers with perianth wanting; stamens 2–6, obpyramidal or prismatic, extrorsely dehiscent; ovary ovoid or oblong, 2- to several-celled, ovules 1 to many, stigma sessile, entire or lobed. Berries crowded, 1–several-seeded; seeds oblong-ovoid or ellipsoid.

TYPE SPECIES: *Arum grandifolium* Jacq., correctly known as *Philodendron grandifolium* (Jacq.) Schott.

A New World genus of about 275 species, *Philodendron* occurs in warm continental and island climates. Many ornamental species have been introduced into cultivation in the Lesser Antilles. For more information about nomenclatorial problems in the genus, see the following articles by G. S. Bunting: A reconsideration of *Philodendron hederaceum*, in *Baileya* 11: 62–67. 1963; Vegetative anatomy and taxonomy of the *Philodendron scandens* complex, in *Gent. Herb.* 10: 136–168. 1968.

KEY TO THE SPECIES

1. Stems stout, terrestrial or rarely epiphytic; leaves 50–100 cm. long, 40–80 cm. wide. *P. giganteum*
- 1a. Stems slender, high-climbing vines, the upper portions often free and pendent; leaves 3–35 cm. long. 2
2. Leaves ovate, 8–12 cm. long, 4–7 cm. wide. *P. scandens*
- 2a. Leaves oblong-ovate. 3
3. Petiole with a conspicuous wing; leaf base rounded to truncate, commonly asymmetrical; veins evenly pinnate, arcuate-ascending. *P. lingulatum*
- 3a. Petiole terete, without wings; leaf base deeply cordate, the lobes rounded or acute; basal veins antrorse. *P. dussii*

Philodendron dussii Engler in Bot. Jahrb. 26: 530. 1899.

Type: Guadeloupe, *Duss 2153* (holotype, B-destroyed).

Scandent herb. Leaves with petioles 40–50 cm. long; blades triangular to sagittate, 30–40 cm. long, 40 cm. wide, the lobes semioblong, obtuse, divergent, the sinus deep and narrow. Peduncle 20–25 cm. long; spathe 9–10 cm. long, the blade 7–8 cm. long; spadix cylindrical, 5–6 cm. long.

OBSERVATIONS: The above description has been compiled from available sources. This species is known only from the type collection as represented by fig. 22 of Das Pflanzenreich IV, 23 Db: 63. 1913. The collection *Duss 4526*, identified and distributed as "*P. dussii*," was assigned by Engler to *Philodendron oxycardium* and by Bunting (Gent. Herb. 10: 136–138. 1968) to *Philodendron scandens* subsp. *isertianum*.

Philodendron giganteum Schott, Syn. Aroid. 89. 1856.

Type: A cultivated plant, origin not specified.

Terrestrial or occasionally epiphytic plants, with stout stems and long adventitious roots. Petioles 50–80 cm. long, nearly terete; blades cordate-ovate, 50–100 cm. long, 40–80 cm. wide, the apex acute, the base cordate. Peduncles stout, to 8 cm. long; spathe convolute, the basal portion oblong-ellipsoid, 6–8 cm. long, purplish, yellow or red, the blade 10–14 cm. long, 4–5 cm. wide, acuminate, yellow becoming red-orange; spadix sessile, stout. Inflorescence surrounded by persistent fleshy spathe; fruits yellow to orange.

GENERAL DISTRIBUTION: Puerto Rico, Virgin Islands, Trinidad, Venezuela.

DISTRIBUTION IN LESSER ANTILLES: Saba!, St. Eustatius!, St. Kitts!, Montserrat!, Guadeloupe!, Dominica!, Martinique!, St. Vincent!.

COMMON NAMES: Grande seguine, china bush, chine.

Philodendron lingulatum (L.) C. Koch, Ind. Sem. Hort. Berol. App. 2. 1855.

Basionym: *Arum lingulatum* L., Sp. Pl. ed. 2. 1371. 1762.

Lectotype: Plumier, Pl. Amer. (ed. Burmannus.) t. 37.

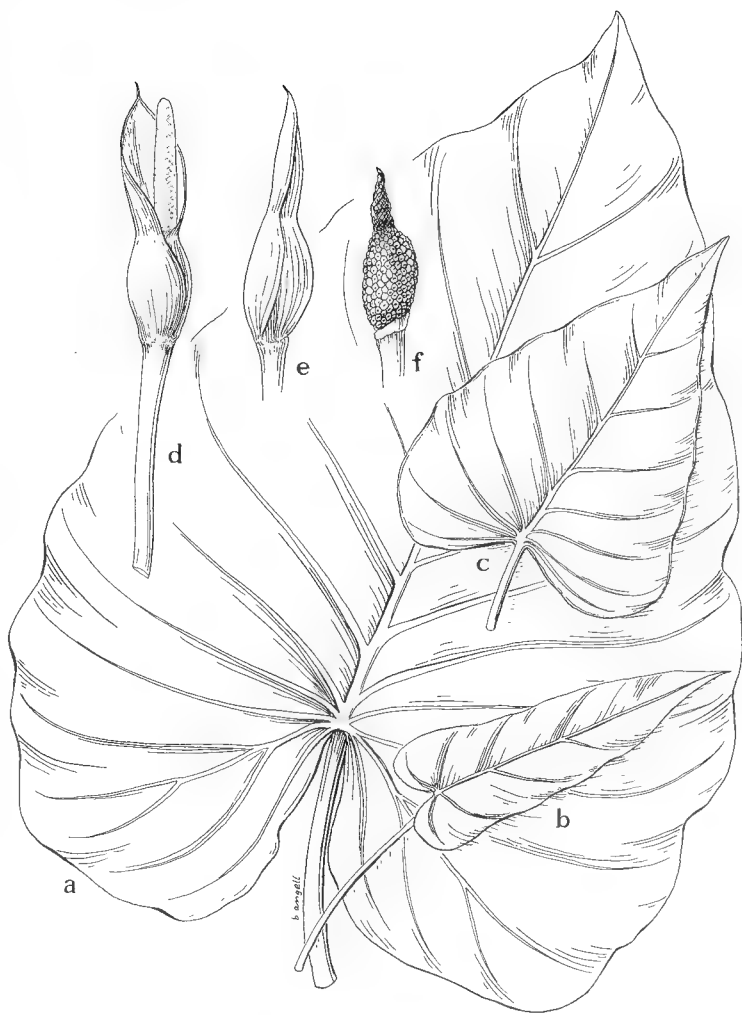


FIGURE 85. Araceae. a-f, *Philodendron giganteum*: a, mature leaf blade and truncated petiole, $\times 0.2$; b, juvenile leaf from seedling plant, $\times 0.2$; c, leaf from branch shoot, $\times 0.2$; d, mature inflorescence, $\times 0.3$; e, young inflorescence with enclosing spathe, $\times 0.3$; f, mature fruiting cluster, the decayed spathe removed, $\times 0.2$.

Syn.: *Philodendron dispar* Schott, Syn. Aroid. 79. 1856. (Type: Plumier, Pl. Amer. (ed. Burmannus.) t. 37.)

Philodendron swartzianum Schott, Oesterr. Bot. Wochenbl. 237. 1857. (Type: St. Kitts, *Euphrasen s.n.* (s).)

High-climbing slender herbaceous vine. Petioles 15–35 cm. long, conspicuously winged nearly to the base of the blade; blades oblong-ovate to ovate, 18–35 cm. long, 10–20 cm. broad, the apex abruptly acuminate, the base rounded, truncate or slightly cordate. Peduncles 2–5 cm. long; spathe 15–18 cm. long, the blade long-acuminate, green outside, whitish inside; spadix cylindrical, shorter than spathe.

GENERAL DISTRIBUTION: Greater and Lesser Antilles.

DISTRIBUTION IN LESSER ANTILLES: Saba!, St. Eustatius!, St. Kitts!, Guadeloupe!, Dominica!, Martinique!, St. Lucia!, St. Vincent!.

OBSERVATION: This taxon is extremely abundant in vegetative or sterile condition and is rarely found in flower.

Philodendron scandens C. Koch & H. Sello, Ind. Sem. Hort. Berol. App. 4. 1853.

Type: A cultivated plant grown in Berlin, origin not stated.

Syn.: *Philodendron micans* Klotsch ex C. Koch, App. Gen. Sp. Nov. Hort. Berol. 7. 1854. (Type: A cultivated plant grown in Berlin.)

Philodendron oxycardium Schott, Syn. Aroid. 82. 1856; Fournet, Fl. Guadeloupe Martinique 424. 1978. (Type: A cultivated plant grown in Vienna.)

Philodendron isertianum Schott, Prodr. Syst. Aroid. 242. 1860. (Type: Martinique, *Isert s.n.* (c).)

Philodendron hederaceum auct.

Scandent slender plant. Juvenile plants with appressed-cordate leaves, freely rooting at each node; blades 3–5 cm. long, 2–3 cm. wide or larger. Mature plants with free apical portions; petioles terete, 10–18 cm. long; blades cordate-ovate, 14–30 cm. long, 10–20 cm. wide, the apex abruptly cuspidate, the base cordate, the basal lobes rounded, the sinus usually narrow and acute. Peduncles 2–3 cm. long; spathes green or purple, convolute at the base, 5–6 cm. long, the expanded limb 5–6 cm. long; spadix cylindric, the pistillate portion 4–5 cm. long, the staminate portion 6–7 cm. long.

GENERAL DISTRIBUTION: Mexico, Central America, Greater Antilles, South America.

DISTRIBUTION IN LESSER ANTILLES: Antigua!, St. Kitts!, Montserrat!, Guadeloupe!, Dominica!, Martinique!, St. Vincent!.

OBSERVATIONS: This plant certainly has a more general distribution than indicated. The plants rarely flower, and sterile specimens may not be collected. Bunting has recognized several formae and subspecies in the Lesser Antilles; these names are here listed as synonyms.

PISTIA Linnaeus

Pistia L., Sp. Pl. 2: 963. 1753.

FIGURE 86.

Floating acaulescent but stoloniferous herb. Leaves subsessile, forming a rosette, spongy in texture, pubescent. Peduncles short; spathe small, white, convolute below, spreading above; spadix adnate to the tube of the spathe, free and spreading above, shorter than the spathe. Flowers with perianth wanting, the single pistillate flower at the base, with 2-8 staminate flowers above; stamens 2, connate, the anthers dehiscent by vertical slits; ovary 1-celled with numerous ovules, the style erect, the stigma penicillate. Fruit with thin pericarp; seeds numerous, cylindrical.

TYPE SPECIES: *Pistia stratiotes* L.

A monotypic, tropical and subtropical genus.

Pistia stratiotes L., Sp. Pl. 2: 963. 1753.

Type: Undetermined.

Aquatic floating or rooted herbs of fresh water. Leaves in a rosette, subsessile or with blade narrowed to the base, cuneate-obovate to oval, 3-12 cm. long, 1.5-5.0 cm. wide, pubescent on both surfaces and tomentose with long matted hairs at the base, the apex rounded, subtruncate or emarginate. Spathes pale green or whitish, 1.2-1.4 cm. long, villose outside. Fruit ellipsoidal, pericarp thin; seeds numerous.

GENERAL DISTRIBUTION: Tropical America, Asia, and Africa.

DISTRIBUTION IN LESSER ANTILLES: Antigua!, Montserrat!, Guadeloupe!, Les Saintes!, Martinique!, St. Vincent!.

COMMON NAMES: Chance, godapail, laitue d'eau, water lettuce.

XANTHOSOMA Schott

Xanthosoma Schott in Schott & Endl., Melet. Bot. 1: 19. 1832.

FIGURE 87.

Terrestrial herbs with thick erect stems or acaulescent with tuberous or rhizomatous base and milky sap. Leaves with petioles long and thick, vaginate below; blades sagittate, hastate or pedately parted. Peduncles usually short; tube of spathe ovoid, convolute, the base persistent, constricted above, the blade oblong-lanceolate; spadix shorter than the spathe. Flowers monoecious, the staminate ones separated from the pistillate ones by aborted flowers; stamens 4-6, connate; ovary ovoid, 2- to 4-celled, with several ovules in each cell, the stigma discoid, 3- or 4-lobed. Berry cylindrical, 3- or 4-celled, the cells several-seeded; seeds ovoid, the testa sulcate.

LECTOTYPE SPECIES: *Xanthosoma sagittifolium* (L.) Schott, based on *Arum sagittae-folium* L.

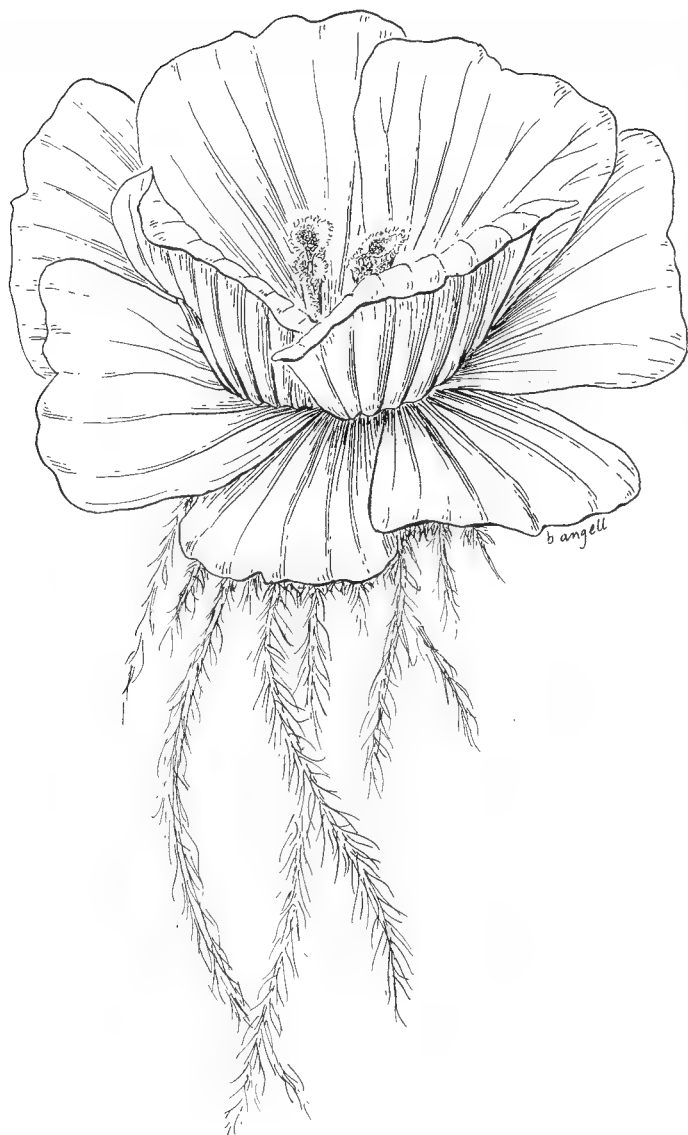


FIGURE 86. Araceae. *Pistia stratiotes*, mature floating plant with inflorescences, $\times 0.7$.

A New World genus of about 45 species ranging from Mexico to tropical South America and the West Indies. For more information about the genus, see D. Nicholson, A new lectotypification of the genus *Xanthosoma* Schott (Araceae), in *Taxon* 24: 345-347. 1975.

At present, no satisfactory treatment of this genus is available, and herbarium material is scanty, inadequate, and poorly preserved. Plants rarely flower in the Lesser Antilles, and collectors have failed to make specimens of sterile plants.

KEY TO THE SPECIES

1. Leaves sagittate. 2
- 1a. Leaves hastate or pedatifid. 4
2. Plants with erect, trunklike stems to 1 m. tall. 3
- 2a. Plants with globose stems not developed above the ground; lamina purplish below. *X. violaceum*
3. Basal lobes of the leaf overlapping; the lowest vein with leaf tissue extending to the petiole. *X. sagittifolium*
- 3a. Basal lobes spreading, the lowest veins lacking leaf tissue basally near the petiole. *X. undipes*
4. Leaves hastate. *X. brasiliense*
- 4a. Leaves pedately divided into 5-12 segments. *X. helleborifolium*

***Xanthosoma brasiliense* (Desf.) Engler, Das Pflanzenr. IV, 23E: 58. 1920.**

Basionym: *Caladium brasiliense* Desf., Cat. Pl. Hort. Paris. ed. 3. 386. 1829.

Type: A cultivated plant grown in Paris.

Syn.: *Xanthosoma hastifolium* sensu Duss, Fl. Phan. Ant. Fr. 481. 1897, if not Koch.

Acaulescent herb with swollen tuberous base. Leaves with petioles 20-40 cm. long; blades ovate-hastate, 25-40 cm. long, 8-25 cm. wide, with spreading oblong basal lobes. Peduncles 15 cm. long or more; convolute base of spathe oblong-ovoid in outline, 5 cm. long, green, the blade oblong-lanceolate, 10-12 cm. long, 3-4 cm. broad, yellowish-green.

GENERAL DISTRIBUTION: Central and South America.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe, Dominica, Martinique, St. Vincent!

OBSERVATIONS: Fournet (Fl. Guadeloupe Martinique 426. 1978) and other writers suggest that this plant is not used for food, although it may bear the common name of calalu.

***Xanthosoma helleborifolium* (Jacq.) Schott, Oesterr. Bot. Zeitschr. 15: 33. 1865.**

Basionym: *Arum helleborifolium* Jacq., Coll. 3: 217. 1789.

Type: Caracas, Venezuela, Jacquin, Ic. Pl. Rar. pl. 613.

Syn.: *Acontias helleborifolium* (Jacq.) Schott in Schott & Endl., Melet. Bot. 1: 19. 1832.

Xanthosoma hastifolium C. Koch, Ind. Sem. Hort. Berol. App. 2. 1855. (Type: A cultivated plant grown in Berlin.)

Acaulescent herb with swollen rootstock. Petioles 30–50 cm. long, mottled; blades pedately divided into 5–12 segments, the outline 20–90 cm. long, 15–35 cm. broad, the segments oblong-lanceolate or oblanceolate, 5–28 cm. long, 2–7 cm. broad, the apex acuminate, the base narrowed. Peduncle 10 cm. long; tube of spathe convolute, elliptic-ovoid in outline, 3–4 cm. long, green, the blade oblong-ovate, 6–7 cm. long, yellowish-green.

GENERAL DISTRIBUTION: Tropical areas of Central and South America.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe!, Dominica!, Martinique!, St. Vincent!.

OBSERVATIONS: Although this plant often appears to be cultivated, the rootstocks are regarded as inedible and said to be toxic.

***Xanthosoma sagittifolium* (L.) Schott in Schott & Endl., Melet. Bot. 1: 19. 1832.**

Basionym: *Arum sagittifolium* L., Sp. Pl. 2: 966. 1753 (as "*sagittae-folium*").

Type: Jamaica, Sloane, Hist. Jam. t. 106, f. 2.

Syn.: *Xanthosoma atrovirens* sensu Fournet, Fl. Guadeloupe Martinique 428. 1978.

Acaulescent when young, but older plants developing thick, erect stems to 1 m. or more tall. Petioles to 1 m. long; blades sagittate-ovate, 40–70 cm. long, 40–60 cm. broad, the apex short-acuminate, the base cordate. Peduncles to 20 cm. long; base of spathe convolute, oblong-ovoid in outline, 6–7 cm. long, 3.5–4.0 cm. in diameter, the blade greenish-white, 7–8 cm. long, 5–6 cm. broad, acuminate; spadix shorter than the spathe.

GENERAL DISTRIBUTION: Cultivated in tropical countries; origin uncertain.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe!, Martinique!, St. Lucia!, St. Vincent!, Barbados.

COMMON NAMES: Taro, malanga, calalu.

OBSERVATION: This is the most common species of the genus occurring in the Lesser Antilles, and is cultivated for food and also persists in wet places. It, too, is poorly represented in herbaria.

***Xanthosoma undipes* (C. Koch.) C. Koch in Bonplandia 4: 3. 1856.**

Basionym: *Alocasia undipes* C. Koch, Ind. Sem. Hort. Berol. App. 4. 1855.

Type: A cultivated plant grown in Berlin.

Syn.: *Xanthosoma jacquinii* Schott in Schott & Endl., Melet. Bot. 1: 19. 1832, nom. nud., Syn. Aroid. 56. 1856, non Schott ex Kunth, 1841; Fournet, Fl. Guadeloupe Martinique 426. 1978.

An ill-smelling herb with an acrid juice, tall thick stems to 1 m. tall. Petioles 45–80 cm. long; blades broadly cordate-sagittate, 40–50 cm. long, 30–40 cm. broad, with basal lobes rounded, the tissue of basal vein not



FIGURE 87. Araceae. *Xanthosoma sagittifolium*, cluster of leaves, $\times 0.1$.

reaching the petiole. Peduncle 10-30 cm. long, convolute tube of spathe ovoid, 5-7 cm. long, 2.5-3.5 cm. in diameter, green on the outside, often purplish within, the blade 10-25 cm. long, 6-8 cm. wide, pale yellowish-green on the outside, whitish within.

GENERAL DISTRIBUTION: Central and South America.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe!, Martinique!, St. Vincent!.

COMMON NAMES: Wild taro, malanga, chou caraibe.

Xanthosoma violaceum Schott, Ind. Hort. Sem. Berl. 370. 1853.

Type: A cultivated plant grown in Berlin.

Acaulescent herb with tuberous rhizome. Petioles 30-70 cm. long, brownish-violet; blades sagittate-ovate, 20-50 cm. long, 15-40 cm. wide, the apex acuminate or apiculate, the basal lobes triangular, obtuse, the sinus acute, the surface pruinose, becoming green. Peduncle 15-20 cm. long, base of spathe convolute, 10 cm. long, 3.5-4.0 cm. in diameter, purplish on the outside, yellowish inside, the blade oblong-lanceolate, 15-20 cm. long, 6-7 cm. broad, yellowish-white.

GENERAL DISTRIBUTION: Central America, Greater Antilles, South America.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe!, St. Lucia.

OBSERVATIONS: There is some question whether or not the correct name for this taxon is *Xanthosoma nigrum* (Vell.) Stellfeld, based on *Arum nigrum* Velloso (used by Fournet, Fl. Guadeloupe Martinique 428. 1978), or whether two species are involved. Herbarium material is inadequate for a satisfactory identification of such plants grown in the Lesser Antilles.

INTRODUCED AND CULTIVATED SPECIES

Many introduced taxa reported in the older literature of botanical gardens in the Lesser Antilles are not represented by herbarium specimens and do not appear to have persisted in cultivation or escaped. Recently, newer horticultural varieties have been introduced by hotels and private collectors. The following taxa and associated localities should be noted especially.

Aglaonema costatum N. E. Br. Reported from St. Lucia.

Alocasia cucullata Schott. One small clump found in a roadside ditch on Martinique (Howard 18667).

Alocasia macrorrhiza Schott. Reported by Fournet (Fl. Guadeloupe Martinique 429. 1978) as naturalized on the windward side of Guadeloupe.

Alocasia portei (Schott) Becc. & Engler. Present near an old roadside shrine near Camp Balata on Martinique.

"*Alocasia cuprea* Koch and *A. sanderiana* Hort." Reported by Fournet (Fl. Guadeloupe Martinique 429. 1978) as cultivated in pots.

"*Amorphophallus campanulatus* Bl. (?)" Reported as cultivated by Fournet (Fl. Guadeloupe Martinique 429. 1978).

Spathiphyllum cannifolium (Dryander) Schott. The illustration of this species, in Curtis Botanical Magazine 17: pl. 603. 1802, is drawn from material obtained from St. Vincent.

Syngonium podophyllum Schott. Various collections (including *Duss* 519) indicate that this species was once cultivated on Guadeloupe. A narrow-leaved, variegated form persists on hillsides at Camp Balata, Martinique (*Howard* 18704).

LEMNACEAE

LEMNACEAE S. F. Gray, Nat. Arr. Brit. Pl. 2: 729. 1821.

Aquatic herbs, floating or submerged and freely drifting, reduced to a minute flat or curved, linear or suborbicular thallus. Roots present or absent, devoid of root hairs, tip covered by a cap. Vegetative reproduction most common by buds from a lateral pocket, plants often remaining attached to parent plant. Plants monoecious, flowering erratic. Flowers developing in a pouch or pit, enclosed by a spathe or spathe wanting; staminate flowers 1 or 2, the anthers dithecous; pistillate flower solitary, with 1-6 ovules, the style short, the stigma concave. Fruit an utricle; seeds ellipsoid, usually ribbed.

TYPE GENUS: *Lemna* Linnaeus.

A cosmopolitan family of very small floating or submerged annual water plants classified in six genera and 30 species. For further information, see C. den Hartog & F. van der Plas, A synopsis of the Lemnaceae, in *Blumea* 18: 355-368. 1970; R. A. Howard, Nomenclatural notes on some Lesser Antillean Monocotyledoneae, in *Jour. Arnold Arb.* 60: 290-301. 1979.

KEY TO THE GENERA

1. Roots present, developing from the lower side of a flattened thallus. . . *Lemna*
- 1a. Roots wanting, thallus ellipsoid or ovoid. *Wolffiella*

LEMNA Linnaeus

Lemna L., Sp. Pl. 2: 970. 1753.

Aquatic, submerged or floating herbs, usually in great numbers with individual thalli cohering. Thalli oblong to ovate, thin or spongy; daughter-thalli budding from lateral pocket. Roots one or several, sheathed with a conspicuous root-cap. Flowering rarely encountered; spathe enclosing 3 flowers, 2 staminate and 1 pistillate. Fruit 1-6-seeded; seeds usually ribbed.

TYPE SPECIES: *Lemna trisulca* L.

A cosmopolitan genus of 15 species.

KEY TO THE SPECIES

1. Roots 3 or more from each thallus; fronds 5-15-nerved. *L. polyrhiza*
- 1a. Roots one from each thallus. 2
2. Fronds 6-10 mm. long, long-stalked and forming tangled mats. ... *L. trisulca*
- 2a. Fronds 2-5 mm. long, sessile or nearly so, forming freely separating masses. 3
3. Fronds linear to elliptic-oblong, 2-3 times as long as broad, sharply pointed at the base, obscurely 1-nerved or nerveless. *L. valdiviana*
- 3a. Fronds broadly oblong, obovate or suborbicular, as broad as long, rounded at the base, obscurely 3-nerved. *L. perpusilla*

Lemna perpusilla Torrey, Fl. New York 2: 245. 1843.

Type: Staten Is., New York, *J. Torrey s.n.* (NY!).

Syn.: *Lemna minor* sensu Griseb., Fl. Br. W. Ind. Isl. 512. 1864; Boldingh, Fl. Dutch W. Ind. Isl. 31. 1909.

Lemna paucicostata Engelm. in Gray, Man. ed. 5. 681. 1867; Duss, Fl. Phan. Ant. Fr. 484. 1897. (Type: Not designated.)

Thallus free-floating, ovate, variable in size, 1.5-4.0 mm. long, 0.7-2.5 mm. wide, asymmetrical, obscurely 3-nerved. Root solitary; root-cap acute.

GENERAL DISTRIBUTION: Cosmopolitan in temperate and tropical areas.

DISTRIBUTION IN LESSER ANTILLES: St. Martin, St. Barts!, Antigua!, Guadeloupe!, Martinique! the Grenadines!, Grenada!, Barbados!.

COMMON NAMES: Duckweed, lentille d'eau, vert de gris.

Lemna polyrhiza L., Sp. Pl. 2: 970. 1753.

Type locality: Europe.

Syn.: *Spirodela polyrhiza* (L.) Schleid. in Linnaea 13: 392. 1839.

Thallus free-floating; fronds elliptic- to orbicular-obovate, 3-8 mm. long, 1.8-6.0 mm. broad, asymmetrical, convex and often purple beneath, palmately 5-15-nerved. Roots 3 or more from single nodal point, budding from two lateral pouches.

GENERAL DISTRIBUTION: Cosmopolitan in temperate and tropical areas.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe; reported by Stehlé (Bull. Soc. Bot. France 123: 453. 1976) without comment and by Fournet (Fl. Guadeloupe Martinique 413. 1978) without verification. No specimens have been seen or reported.

OBSERVATIONS: C. den Hartog's proposal to conserve *Spirodela* Schleidena (Taxon 19: 647. 1970) was deemed unnecessary (Taxon 21: 534. 1972).

Lemna trisulca L., Sp. Pl. 2: 970. 1753.

Type: LINN 1093.1, from Europe.

Submerged aquatic. Thalli thin, oblong-lanceolate, 5-10 mm. long, 2-4 mm. wide with a long stipe, buds remaining attached and forming a reticulum. Roots, if present, solitary; root-cap acute.

GENERAL DISTRIBUTION: Cosmopolitan.

DISTRIBUTION IN LESSER ANTILLES: Antigua. Grisebach (Fl. Br. W. Ind. Isl. 512. 1864) cited a Wulschlaegel collection, but recent workers have not cited the specimen. Herbarium notes in the British Museum indicate Box sought this plant to no avail.

Lemna valdiviana Philippi in *Linnaea* 33: 239. 1864.

Type: Chile, *Philippi* in 1864.

Floating plants solitary or in easily separating masses. Fronds oblong to obovate-oblong, 3.5-4.5 mm. long, 0.5-1.3 mm. broad, rounded at the base, obscurely 1-nerved. Root solitary; root-cap strongly curved.

GENERAL DISTRIBUTION: Temperate and tropical America.

DISTRIBUTION IN LESSER ANTILLES: Antigua, Guadeloupe, Les Saintes, Marie Galante, Martinique.

COMMON NAMES: Duckweed, lentille d'eau.

OBSERVATION: Fournet (Fl. Guadeloupe Martinique 413. 1978) accepts *Lemna cyclostasa* (Ell.) Chev. as the correct name for this species, listing *Lemna valdiviana* Philippi as a synonym. The current treatment follows that of den Hartog & van der Plas.

WOLFFIELLA Hegelmaier

Wolffiella Hegelm. in *Bot. Jahrb.* 21: 303. 1895.

Submerged water plants. Fronds flat, asymmetric, linear-oblong, without nerves or roots. Budding pouch triangular, asymmetric, dorsiventrally flattened, opening by a transverse slit. Inflorescence solitary, consisting of 2 flowers, one staminate and one pistillate. Fruit slightly compressed.

TYPE SPECIES: *Wolffiella oblonga* (Phil.) Hegelm.

A genus of about eight species found in tropical America and Africa.

Wolffiella lingulata (Hegelm.) Hegelm. in *Bot. Jahrb.* 21: 303. 1895.

Basionym: *Wolffia lingulata* Hegelm., *Lemnaceae* 132. 1868; Fournet, *Fl. Guadeloupe Martinique* 413. 1978.

Type: Mexico, *L. Hahn s.n.*

Minute green plants with fronds 1.5-5.0 mm. long, 0.2-2.0 mm. wide.

GENERAL DISTRIBUTION: Mexico, Central America.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe; collected in L'Herminier, according to Hegelmaier, and also reported by Questel (Fl. Guad. 33. 1951). No material seen.

OBSERVATION: These minute plants have been found in collections of *Lemna* made in ponds where *Nymphaea* was present.

BROMELIACEAE

BROMELIACEAE A. L. Jussieu, Gen. 49. 1789.

FIGURES 88, 89.

Herbs, mostly epiphytic and rosulate. Leaves spirally arranged, dilated and sheathing below, simple, entire or spinose-serrate, bearing peltate scales when young. Inflorescence simple or paniculate, of spikes or racemes, usually bearing bright-colored, conspicuous bracts. Flowers perfect in Lesser Antillean species; sepals and petals free or connate, stamens 6 in two series, the filaments free or joined to the petals or to each other; ovary superior to half-inferior or inferior. Fruit capsular and dehiscent or baccate; seeds naked, winged or plumose.

TYPE GENUS: *Bromelia* Linnaeus.

Characteristically a tropical American family, the Bromeliaceae comprises 44 genera and about 1400 species distributed in the West Indies and the Americas. Most species are epiphytic and have morphological structures adapted to xerophytic habits. For more information on the family, see L. B. Smith, Bromeliaceae, in N. Am. Fl. 19(2): 61-228. 1938; L. B. Smith & R. J. Downes, Pitcairnioideae, in Fl. Neotropica 14(1): 1-658. 1974; L. B. Smith & R. J. Downes, Tillandsioideae, in Fl. Neotropica 14(2): 663-1492. 1977.

KEY TO THE GENERA

1. Fruit capsular; mature seed appendaged; ovary superior to inferior. 2
- 1a. Fruit baccate; mature seed unappendaged; ovary inferior; cells of the leaf-scales irregularly arranged; plants often epiphytic. (Subfamily Bromelioideae). 7
2. Seed-appendages entire; leaves mostly spinose-serrate; cells of the leaf-scales irregularly arranged; plants terrestrial. (Subfamily Pitcairnioideae). *Pitcairnia*
- 2a. Seed-appendages finely divided and forming a coma; leaves always entire; cells of the leaf-scales radially symmetric; plants mostly epiphytic. (Subfamily Tillandsioideae). 3
3. Ovary nearly or quite superior; seeds wholly or almost wholly plumose at one end. 4
- 3a. Ovary only half superior; seeds equally plumose-appendaged at both ends; flowers polystichous. *Glomeropitcairnia*
4. Appendage of the seed wholly or largely basal, straight at maturity 5
- 4a. Appendage of the seed very largely apical, folded at maturity; sepals strongly asymmetric; flowers in at least slightly more than 2 ranks. *Catopsis*
5. Petal claws free or with a very short tube exceeded by the sepals; flowers distichous in most species. 6

- 5a. Petal claws conglutinated in a tube that equals the sepals; spikes always polystichous-flowered. *Guzmania*
- 6. Petals naked; inflorescence of one or more distichous-flowered spikes or rarely reduced to a single polystichous-flowered spike or to a single flower. *Tillandsia*
- 6a. Petals bearing scales on the inside of the claw; inflorescence as in *Tillandsia* except rarely of more than one polystichous-flowered spike. *Vriesea*
- 7. Ovaries and floral bracts fusing into a compound fruit after anthesis; inflorescence simple with a terminal foliaceous coma. *Ananas*
- 7a. Ovaries and floral bracts remaining distinct after anthesis; inflorescence without a terminal foliaceous coma. 8
- 8. Petals free; filaments not forming a tube. 9
- 8a. Petals joined to a filament-tube by their centers, fleshy; coarse terrestrial with leaves over a meter long, with large lax curved spines. *Bromelia*
- 9. Flowers subterete, often distichous; sepals uniform. *Aechmea*
- 9a. Flowers strongly compressed, polystichous in strobiliform spikes; sepals dimorphic; inflorescence compound; cultivated. *Hohenbergia*

AECHMEA Ruiz & Pavon

Aechmea R. & P., Fl. Per. 47. 1794, nom. cons.

Syn.: *Wittmackia* Mez in Mart., Fl. Bras. 3(3): 274. 1891. (Type species: *Bromelia lingulata* L.)

Chevalliera Griseb., Fl. Br. W. Ind. Isl. 591. 1864, non Gaudichaud, 1843.

Epiphytic or rarely terrestrial, stemless herbs. Leaves rosulate, usually linear, with prickles on margins. Inflorescence of compact, distichous spikes or laxly bipinnate and polystichous. Flowers usually sessile; sepals uniform although often asymmetric, usually mucronate; petals free, with two scales; second series of stamens more or less joined to the petals; style shorter or longer than the stamens, the stigma lobes linear, often twisted. Seeds small, rugose, often curved, dark colored, naked.

TYPE SPECIES: *Aechmea paniculata* Ruiz & Pavon.

A genus of about 150 species occurring in the West Indies and South America.

KEY TO THE SPECIES

- 1. Flowers densely distichous. 2
- 1a. Flowers laxly polystichous. *A. lingulata*
- 2. Sepals exerted above the floral bracts at anthesis; lower primary bracts entire. *A. smithiorum*
- 2a. Sepals included in the floral bracts at anthesis; lower primary bracts serrate. *A. serrata*

Aechmea lingulata (L.) Baker in Jour. Bot. 17: 164. 1879.

Basionym: *Bromelia lingulata* L., Sp. Pl. 1: 285. 1753.

Type: Plumier, Pl. Amer., t. 64, f. l. 1756.

Syn.: *Chevalliera lingulata* (L.) Griseb., Fl. Br. W. Ind. Isl. 591. 1864.

Wittmackia lingulata (L.) Mez in Mart., Fl. Brasil. 3(3): 275. 1891; Duss, Fl. Phan. Ant. Fr. 570. 1897; Gooding *et al.*, Fl. Barbados 94. 1965; Fournet, Fl. Guadeloupe Martinique 64. 1978.

Aechmea plumieri Baker, Handb. Bromel. 50. 1889. (Type: West Indies, "Plum. Vol. 5, t. 67, 68.")

Epiphytic herb. Leaves to 1 m. long, 4–6 cm. wide, apex abruptly acutely tipped, margins with curved prickles 1–2 mm. long, under-surface lepidote. Scape flocculose when young; bracts lanceolate-acuminate. Inflorescence with suberect and curved branches 10–20 cm. long; floral bracts linear-lanceolate, long-attenuate. Flowers sessile; sepals 5–6 mm. long; petals 10 mm. long, acute. Fruit ovoid, acute, 8–10 mm. long.

GENERAL DISTRIBUTION: Central America, Greater Antilles, Trinidad, South America.

DISTRIBUTION IN LESSER ANTILLES: Antigua!, Saba!, Guadeloupe!, Marie Galante!, Dominica!, Martinique, St. Lucia!, St. Vincent!, the Grenadines, Barbados!.

COMMON NAMES: Ananas marron, ananas sauvage.

Aechmea serrata (L.) Mez in DC., Monogr. Phan. 9: 243. 1896.

Basionym: *Tillandsia serrata* L., Sp. Pl. 1: 286. 1753.

Type: Plumier, Pl. Amer., t. 75, f. 1 [habit only].

Syn.: *Aechmea martinicensis* Baker in Jour. Bot. 17: 132. 1879. (Lectotype: Martinique, *Hahn* 522 (selected by L. B. Smith).)

Epiphyte. Leaves ligulate, acuminate and mucronate at apex, to 80 cm. long, 3.5 cm. wide, armed with coarse, pale teeth 5 mm. long, densely white-lepidote below. Inflorescence scapose; scape bracts imbricate, ovate-acuminate, serrate; branches densely bipinnate, ovoid, many-flowered, the primary bracts equaling or exceeding the spikes, the rachis compressed, 4-winged and excavated; floral bracts broadly ovate, entire or serrulate, mucronulate, equaling the sepals. Flowers sessile; sepals asymmetric, 13 mm. long with a slender terminal mucro 4 mm. long; petals mucronate, 18 mm. long, purple; ovary ellipsoid, 8 mm. long, constricted at the apex, epigynous tube deeply infundibuliform. Berry scarcely enlarged.

GENERAL DISTRIBUTION: Known only from Martinique.

DISTRIBUTION IN LESSER ANTILLES: Martinique!.

COMMON NAME: Ananas sauvage.

Aechmea smithiorum Mez in DC., Monogr. Phan. 9: 246. 1896; L. B. Smith in Phytologia 16: 62. 1968.

Type: St. Vincent, *H. H. & G. W. Smith* 1425 (B).

Syn.: *Aechmea serrata* sensu Duss, Fl. Phan. Ant. Fr. 570. 1897, non (L.) Mez.

Aechmea lavandulacea C. H. Wright in Curtis Bot. Mag. 131: pl. 8005. 1905.



FIGURE 88. Bromeliaceae. a, b, *Aechmea smithiorum*: a, habit, $\times 0.1$; b, inflorescence, $\times 0.5$. c, *Bromelia pinguin*, infructescence, $\times 0.1$; d, *Ananas comosus*, compound fruit (the pineapple), $\times 0.1$.

(Type: Cultivated, flowering plant at Kew sent by Broadway from Grenada.)

Leaves ligulate, to 70 cm. long, 4-5 cm. wide, rounded and mucronulate at the apex, densely covered with dark brown curved spines to 3 mm. long, pale green, minutely punctulate-lepidote. Scape bracts erect, lanceolate, acuminate. Inflorescence compound with simple branches, ellipsoid, obtuse, 12 cm. long, 5 cm. in diameter; spikes sessile or subsessile, polystichous on the main axis, distichously 6- to 13-flowered, strongly complanate; floral bracts cymbiform, 11 mm. long with a mucro 5 mm. long, pinkish-white, exceeded by the sepals. Flowers sessile; sepals asymmetric, 1 cm. long with a mucro 3 mm. long, cinereous or tomentulose, pinkish-purple; ovary 5 mm. long, enlarged in fruit to 10 mm. in diameter.

GENERAL DISTRIBUTION: Endemic to the Lesser Antilles.

DISTRIBUTION IN LESSER ANTILLES: Montserrat, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Grenada.

Aechmea fulgens Brongn. was reported as cultivated by Duss (Fl. Phan. Ant. Fr. 571. 1897). However, the correct determination of the Duss specimen (no. 3957 (NY)) is *Bilbergia pyramidalis* (Sims) Lindley, a South American species established in gardens in St. Kitts and Guadeloupe and thought to be native. Fournet's use of the binomial *Aechmea fulgens* may be a repetition of the incorrect determination.

ANANAS Miller

Ananas Mill., Gard. Dict. Abr., ed. 4. 1754.

Terrestrial herb. Leaves rosulate, linear, stiff, the margins densely armed with hooked spines. Inflorescence spicate, scapose. Flowers perfect; sepals distinct, erect; petals distinct, ligulate; stamens shorter than the petals; ovary inferior, the style filiform. Fruit aggregate, syncarpous, fleshy; seeds usually wanting, naked.

TYPE SPECIES: *Bromelia ananas* L., now correctly known as *Ananas comosus* (L.) Merrill.

A tropical American genus of five species.

Ananas comosus (L.) Merrill, Interpr. Rumph. Amb. 133. 1917.

Basionym: *Bromelia comosa* L., Herb. Amb. 21. 1754.

Type: Rumphius, Herb. Amb. 5: 227, t. 8, ex Merrill.

Syn.: *Bromelia ananas* L., Sp. Pl. 1: 285. 1753. (Type: Not selected.)

Ananas ananas (L.) Cockerell in Proc. U. S. Natl. Mus. 19: 776. 1897.

Ananas sativus Schult. f. in Roem. & Schult., Syst. Veg. 7: 1283. 1830.

Ananas comosus var. *sativus* (Schult. f.) Stehlé in Bull. Soc. Bot. France 123: 448. 1976, illeg.

Cultivated or persistent rosulate herb. Leaves to 1 m. long, spine-tipped, the stout marginal spines straight or curved, 2-4 mm. long. Scape shorter

than leaves, the flowering area subtended by branches. Flowers sessile, erect-ascending; sepals 5-7 mm. long; petals clawed, broader above, 15 mm. long, violet. Syncarpous fruit varies considerably in size, topped by rosette of leaves.

GENERAL DISTRIBUTION: Native of Brazil, widely cultivated in the tropics.

DISTRIBUTION IN LESSER ANTILLES: Once widely cultivated, but poorly represented by herbarium specimens.

COMMON NAMES: Ananas, pine, pineapple.

BROMELIA Linnaeus

Bromelia L., Sp. Pl. 1: 285. 1753.

Large, terrestrial herbs spreading by subterranean stolons. Leaves usually rosulate, with large curved spines along the margin. Inflorescence sessile or stipitate and paniculate. Flowers with sepals free or somewhat united, obtuse or acute; petals dorsally united by the filaments, margins free, eligulate, fleshy; stamens included, joined by their filaments; ovary tapering into a thick pedicel. Berry succulent; seeds few to many, naked, flattened.

TYPE SPECIES: *Bromelia pinguin* L.

A genus comprised of about forty tropical American and West Indian species.

KEY TO THE SPECIES

1. Inflorescence dense, subglobose, sessile in the center of the leaf-rosette, coarsely brown-lepidote; sepals narrowly lanceolate, acute. *B. plumieri*
- 1a. Inflorescence elongate, scapose, white-farinose; sepals very narrowly triangular-subulate. *B. pinguin*

Bromelia pinguin L., Sp. Pl. 1: 285. 1753.

Lectotype: Dillenius, Elth. 320, pl. 240, f. 311. 1732.

Leaves many, rosulate, often over 2 m. long, linear, acuminate, armed with stout teeth to 10 mm. long. Scape stout, white-farinose. Inflorescence branched, each branch with as many as 12 flowers. Flowers pedicellate; sepals narrowly triangular-subulate; petals to 3 cm. long, linear-elliptic, rose with white base and margins, densely woolly tomentose. Berry ovoid, to 3.5 cm. long, yellow, acid, aromatic.

GENERAL DISTRIBUTION: Mexico, Central America, Greater Antilles, South America.

DISTRIBUTION IN LESSER ANTILLES: St. Martin, St. Barts!, Antigua, Saba, St. Eustatius, Martinique, St. Vincent, Barbados!.

COMMON NAMES: Karatas, pingouin, bayonette, pinguin.

Bromelia plumieri (Morren) L. B. Smith in Phytologia 15(3): 173. 1967.

Basionym: *Karatas plumieri* Morren, Belg. Hortic. 22: 131. 1872.

Type: Specimen or illustration not selected.

Syn.: *Bromelia karatas* auct., non L.; Duss, Fl. Phan. Ant. Fr. 569. 1897; Gooding *et al.*, Fl. Barbados 93. 1965.

Nidularium karatas Lemaire ex Griseb., Fl. Br. W. Ind. Isl. 591. 1864, in part.

Plant to 3 m. in diameter. Leaves in dense rosette, to 1.5 m. long, acuminate, pungent, densely serrate with stout, brown teeth 5-8 mm. long. Inflorescence many-flowered, capitiform and flat-topped, sunk in center of rosette and surrounded by red leaves. Flowers on short, stout pedicels; sepals narrowly lanceolate, acute, 3 cm. long; petals narrowly lanceolate, to 4 cm. long, connate for more than 2 cm., rose with white base and margins; ovary ferruginous-lepidote. Berry fusiform, 8 cm. long, 2 cm. in diameter.

GENERAL DISTRIBUTION: Mexico, Central America, Greater Antilles, South America.

DISTRIBUTION IN LESSER ANTILLES: Cultivated as hedge plant in Martinique!, Dominica!, Barbados (reported by Gooding *et al.*).

COMMON NAMES: Karatas, pingouin, pingwing, pinguin.

CATOPSIS Grisebach

Catopsis Griseb., Fl. Br. W. Ind. Isl. 599. 1864.

Epiphytic, rosette-forming, lepidote herb. Inflorescence scapose, spicate, or paniculate. Flowers sessile, perfect (in Lesser Antillean species) or functionally pistillate with staminodes; sepals strongly asymmetric; petals free, without scales, white or yellow; ovary ovate or ellipsoidal, the style shorter than the ovary or lacking. Capsule dehiscent above the middle; seeds thick, the coma apical, folded at maturity.

TYPE SPECIES: *Tillandsia nutans* Sw., correctly known as *Catopsis nutans* (Sw.) Griseb.

A genus of 25 species occurring in Florida, the West Indies, and Mexico to tropical South America. For more information about the genus in the neotropics, see L. B. Smith and R. J. Downs, Tillandsioideae, in Fl. Neotropica 14: 1366-1388. 1977.

KEY TO THE SPECIES

1. Leaf blades ligulate; scape bracts much shorter than the internodes; sepals 7-8 mm. long. *C. sessiliflora*
- 1a. Leaf blades narrowly triangular; scape bracts imbricate; sepals 4-6 mm. long. *C. floribunda*

Catopsis floribunda L. B. Smith in Contr. Gray Herb. 117: 5. 1937;
Phytologia 16: 67. 1968.

Holotype: Martinique, Plée (P).

Syn.: *Pogospermum floribundum* Brongn. in Ann. Sci. Nat. ser. 5, 1: 328. 1864,
prov. nom.

Catopsis nitida sensu Duss, Fl. Phan. Ant. Fr. 577. 1897, in part, non
(Hooker) Griseb., 1864.

Catopsis nutans sensu Griseb., Fl. Br. W. Ind. Isl. 599. 1864, in part, excl.
type.

Leaves of rosette 20-40 cm. long, 15-30 mm. wide at base, narrowly triangular and long-acuminate. Scape erect, glabrous. Inflorescence paniculate, 15-40 cm. long, branches 8- to 36-flowered. Flowers with sepals broadly elliptic, 4-6 mm. long; petals elliptic, 7 mm. long, obtuse; style short or absent. Capsule ovoid, acute, 9-11 mm. long.

GENERAL DISTRIBUTION: Florida, Greater Antilles, Trinidad, Venezuela.

DISTRIBUTION IN LESSER ANTILLES: St. Martin!, Antigua!, Saba!, St. Eustatius!, Montserrat!, Guadeloupe!, Dominica!, Martinique!, St. Lucia, St. Vincent!, the Grenadines!.

COMMON NAMES: Ananas sauvage.

Catopsis sessiliflora (R. & P.) Mez in DC., Monogr. Phan. 9: 625. 1896.

Basionym: *Tillandsia sessiliflora* R. & P., Fl. Peru. 3: 42, t. 271. 1802.

Type: Peru, Ruiz & Pavon s.n. (holotype, M?).

Syn.: *Catopsis nitida* sensu Duss, Fl. Phan. Ant. Fr. 577. 1897, in part, and
Fournet, Fl. Guadeloupe Martinique 72. 1978, non (Hooker) Griseb., 1864.

Rosette leaves lingulate, 20 cm. long or less, 1.5-2.2 cm. wide, apex rounded or obtuse and apiculate. Inflorescence a simple spike or having 2 or 3 nearly erect branches. Flowers with sepals 10-18 mm. long; petals ovate, white, as long as sepals; style short. Capsule ovoid, acute, 10-12 mm. long.

GENERAL DISTRIBUTION: Mexico, Central America, Cuba, Hispaniola, Puerto Rico, Tobago, northern South America.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe!, Martinique!, Grenada!.

GLOMEROPITCAIRNIA Mez

Glomeropitcairnia Mez in Bull. Herb. Boiss. II, 5: 232. 1905.

Large, stemless, epiphytic herbs. Leaves rosulate, entire. Scape erect, elongate. Inflorescence of short-stipitate spikes, bipinnate or tripinnate. Flowers perfect; sepals free, subsymmetrical; petals free, with two scales at the base; ovary half inferior. Capsule imperfectly dehiscent; seeds with a papiform coma at both ends.

TYPE SPECIES: *Tillandsia penduliflora* Griseb., now known as *Glomeropitcairnia penduliflora* (Griseb.) Mez.

A genus of two species found in Venezuela and the West Indies. See also L. B. Smith and R. J. Downs, Tillandsioideae, in *Fl. Neotropica* 14: 1388-1391. 1977.

Glomeropitcairnia penduliflora (Griseb.) Mez in Bull. Herb. Boiss. II, 5: 232. 1905.

Basionym: *Tillandsia penduliflora* Griseb., Fl. Br. W. Ind. Isl. 597. 1864.

Holotype: Dominica, Imray 107 (κ).

Syn.: *Pitcairnia penduliflora* (Griseb.) Mez in DC., Monogr. Phan. 9: 463. 1896; Duss, Fl. Phan. Ant. Fr. 571. 1897.

Epiphytic herb. Rosette large, leaves to 1 m. or more in length and to 10 cm. in width, glabrous, margin smooth, the apex long-attenuate. Inflorescence to 3 m. tall, laxly tripinnate, red, glabrous, the spikes recurved, ovoid, or ellipsoid, 4-8 cm. long; floral bracts erect, imbricate, ovate, abruptly acute, 25-35 mm. long, convex and keeled. Flowers subsessile; sepals 24 mm. long; petals ligulate, equaling the sepals. Capsule 30-35 mm. long, slenderly conical and acuminate.

GENERAL DISTRIBUTION: Endemic to the Lesser Antilles.

DISTRIBUTION IN LESSER ANTILLES: Montserrat!, Guadeloupe!, Dominica!, Martinique!.

GUZMANIA Ruiz & Pavon

Guzmania R. & P., Fl. Per. 3: 37, pl. 261. 1802; Smith in *Phytologia* 21: 73-96. 1971.

Syn.: *Thecophyllum* André; Bromel. Andr. 107. 1889. (Type species: *Thecophyllum poortmani* André.)

Epiphytic plants. Basal leaves above dilated bases with parallel sides and abruptly narrowed apices. Inflorescence simple. Flowers solitary in axils of bracts; sepals oblong, shortly connate at base; petals agglutinated at the base, the free blades shorter than the tube; stamens inserted at the throat of the corolla tube; style elongate. Capsules dehiscent; seeds basally comose.

TYPE SPECIES: *Guzmania tricolor* R. & P.

A tropical, New World genus of about 110 species. For more information, see L. B. Smith and R. J. Downs, Tillandsioideae, in *Fl. Neotropica* 14: 1275-1364. 1977.

KEY TO THE SPECIES

1. Inflorescence simple, subglobose, involucrate. *G. lingulata*
- 1a. Inflorescence compound, elongate. 2

2. Branches suberect to spreading, laxly many-flowered, to 12 cm. long, usually much exceeding the primary bracts; flowers more or less secund. *G. plumieri*
- 2a. Branches strict, densely few-flowered, covered by the primary bracts. 3
3. Floral bracts subtriangular, 40 mm. long, about equaling the acute sepals; flowers subsessile. *G. megastachya*
- 3a. Floral bracts elliptic, 32 mm. long, much exceeded by the obtuse sepals; flowers slenderly pedicellate. *G. dussii*

Guzmania dussii Mez in DC., Monogr. Phan. 9: 923. 1896.

Type: Guadeloupe, *Duss 3326* (BNV).

Syn.: *Thecophyllum dussii* (Mez) Mez in Bull. Herb. Boiss. II, 3: 131. 1903; Fournet, Fl. Guadeloupe Martinique 69. 1978.

Epiphytic plant. Leaves to 60 cm. long; blades acuminate and apically pungent, glabrous or minutely punctulate. Scape erect, stout, bearing imbricate, foliaceous, reddish bracts. Inflorescence densely bipinnate, cylindrical, 30 cm. long and 15 cm. in diameter; floral bracts 32 mm. long, much exceeded by the sepals. Flowers erect, fasciculate; pedicels 12–15 mm. long; sepals elliptic-obtuse, 22–28 mm. long, brown with pale margin; petals linear, obtuse, cucullate, 32 mm. long, dark yellow when dry. Capsule ellipsoid, 3 cm. long, beaked; coma flavous.

GENERAL DISTRIBUTION: Endemic to the Lesser Antilles.

DISTRIBUTION IN LESSER ANTILLES: Nevis!, Guadeloupe!, Dominica!.

Guzmania lingulata (L.) Mez in DC., Monogr. Phan. 9: 899. 1896.

Basionym: *Tillandsia lingulata* L., Sp. Pl. 1: 286. 1753.

Lectotype: Jamaica, *Sloane s.n.* (BM).

Epiphytic plant. Leaves linear, 30–50 cm. long, the apex acuminate, the upper scape leaves forming a cup-shaped involucre. Inflorescence dense, many-flowered, corymbiform; floral bracts red, longer than the sepals. Flowers with sepals linear, 15–18 mm. long; petals linear, rounded and hooded at apex, white. Capsule oblong, short-beaked, 3 cm. long; coma red-brown.

GENERAL DISTRIBUTION: Central America, Greater Antilles, Trinidad, South America.

DISTRIBUTION IN LESSER ANTILLES: St. Martin (reported by Boldingh), Antigua!, Saba (reported by Boldingh), Guadeloupe!, Dominica!, Martinique!, St. Lucia!, St. Vincent!, Grenada!, Barbados (reported by Gooding *et al.*).

COMMON NAMES: "Caraguata," ananas sauvage.

Guzmania megastachya (Baker) Mez in DC., Monogr. Phan. 9: 928. 1896.

Basionym: *Tillandsia megastachya* Baker in Jour. Bot. 26: 46. 1888.

Type: St. Vincent, *Guilding s.n.* (K).

Syn.: *Tillandsia magna* Baker, Handb. Bromel. 210. 1889. (Type: Martinique, Hahn 521, in part (B, BM).)

Tillandsia dominicensis Baker ex Mez in DC., Monogr. Phan. 9: 928. 1896, nomen in synon.

Tillandsia foliosa sensu Griseb., Fl. Br. W. Ind. Isl. 597. 1864, non Mart. & Gal., 1843.

Epiphytic. Leaves rosulate, to 1 m. long; blades 4 cm. wide, acute, obscurely punctulate-lepidote. Scape stout, erect, bracts imbricate, elliptic-lanceolate. Inflorescence many-flowered, subcylindric, the primary bracts 55-80 mm. long, exceeding the axillary spikes, the spikes subsessile, corymbose; floral bracts subtriangular, exceeding the sepals, strongly carinate. Flowers 6.2 cm. long, subsessile; sepals linear, acute; petals yellow, glutinated into a narrow tube, the lobes narrowly elliptic, obtuse. Capsule subclavate, 37 mm. long; coma castaneous.

GENERAL DISTRIBUTION: Lesser Antilles and Tobago.

DISTRIBUTION IN LESSER ANTILLES: Montserrat!, Guadeloupe!, Dominica!, Martinique, St. Lucia!, St. Vincent!, Grenada!.

Guzmania plumieri (Griseb.) Mez in DC., Monogr. Phan. 9: 950. 1896.

Basionym: *Brocchinia plumieri* Griseb., Fl. Br. W. Ind. Isl. 593. 1864.

Lectotype: Dominica, *Imray 108* (GOET) ex L. B. Smith.

Syn.: *Tillandsia martinicensis* Baker in Jour. Bot. 26: 45. 1888. (Type: Martinique, Hahn 523.)

Pitcairnia plumieri (Griseb.) Baker, Handb. Bromel. 107. 1889.

Tillandsia excelsa sensu Boldingh, Fl. Dutch W. Ind. Isl. 33. 1909, non Griseb.

Epiphytic. Leaves rosulate, ligulate, to 40 cm. long and 7.5 cm. wide, broadly acute with pungent apiculum, subglabrous, red at apex. Scape erect. Inflorescence 2- or 3-pinnate, to 40 cm. long, the branches suberect to spreading, to 12 cm. long, laxly polystichous-flowered; floral bracts broadly ovate-elliptic, 15 mm. long, shorter than sepals. Flowers 12-15, slightly secund; sepals orange or red, 18 mm. long; petals yellow. Capsule slenderly ellipsoid, 13 mm. long.

GENERAL DISTRIBUTION: The Lesser Antilles and Venezuela.

DISTRIBUTION IN LESSER ANTILLES: St. Kitts!, Nevis!, Montserrat!, Guadeloupe!, Dominica!, Martinique!, St. Vincent!, Grenada!.

OBSERVATION: In mossy forest areas, the young inflorescence is commonly encased in a gelatinous substance of considerable bulk.

PITCAIRNIA L'Heritier

Pitcairnia L'Her., Sert. Angl. 7. 1788, nom. cons.

Syn.: *Hepetis* Sw., Prodr. 4, 56. 1788. (Type species: *H. angustifolia* Sw.)

Terrestrial or saxicolous. Leaves rosulate, dimorphic, spinulose-margined or entire. Inflorescence scapose, spicate, racemose or paniculate. Flowers

perfect; sepals distinct, convolute, acute or mucronate; petals distinct, ligulate, mostly red or yellow; stamens as long as petals or shorter; ovary partly superior, the style filiform, the stigma capitate. Fruit capsular, 3-valved, septicidally dehiscent; seeds numerous, variously winged.

TYPE SPECIES: *Pitcairnia bromeliifolia* L'Heritier.

A genus of about 250 species generally occurring in tropical America and the West Indies, but with one African species. For additional information, see R. W. Read, Preliminary studies of *Pitcairnia* in the eastern Caribbean, in *Phytologia* 19: 270-280. 1970; L. B. Smith and R. J. Downs, *Pitcairnioidae*, in *Fl. Neotropica* 14: 244-437. 1974.

KEY TO THE SPECIES

1. Inflorescence compound, lax. *P. angustifolia*
- 1a. Inflorescence simple, dense. 2
2. Leaf blades glabrous beneath, except at base and apex; flowers strongly decurved after anthesis; petals more than 11 mm. wide. *P. micotrinensis*
- 2a. Leaf blades densely lepidote beneath; flowers not strongly decurved after anthesis; petals less than 10 mm. wide. 3
3. Floral bracts in the upper $\frac{1}{4}$ of the inflorescence less than 13 mm. long; petals less than 6 mm. wide; sepals obtuse or apiculate; petals bright red. *P. spicata*
- 3a. Floral bracts in the upper $\frac{1}{4}$ of the inflorescence more than 14 mm. long; petals more than 7 mm. wide, variously colored. 4
4. Sepals glabrous to glabrescent; petals red, red-orange or yellow. *P. bifrons*
- 4a. Sepals with multicellular clavate trichomes; petals cream to yellow. *P. sulphurea*

Pitcairnia angustifolia Aiton, Hort. Kew. 1: 401. 1789.

Type: St. Croix, *J. Ryan s.n.* (BM).

Syn.: *Pitcairnia latifolia* Aiton, Hort. Kew. 1: 401. 1789. (Type: *Anderson s.n.* in Hort. Kew (BM).)

Pitcairnia ramosa Jacq. f., Eclog. Pl. 1: 154. 1816. (Type: Illus. Eclog. Pl. pl. 79. 1809(?).)

Pitcairnia gracilis Mez in DC., Monogr. Phan. 9: 407. 1897. (Type: Guadeloupe, *L'Herminier s.n.* (G).)

Pitcairnia alta Hasskarl, Retzia ii: 5. (as cited in Baker, Jour. Bot. 19: 266. 1881.) (Type: Dominica, *Imray s.n.*)

Acaulescent. Leaves rosulate, dimorphic, 50-120 cm. long, arching, with pendulous apices, lepidote abaxially on sheath; blades linear-lanceolate, 13-30 mm. wide, serrate to subentire, the margins spiny, the surfaces covered with fimbriate scales. Inflorescence erect, to 1.5 m. tall, 2- or 3-branched, laxly flowered; floral bracts narrowly triangular-linear-lanceolate, 4-12 mm. long. Flowers with pedicels 4-14 mm. long, erect; sepals 15-23 mm., acute to rounded-apiculate; petals red, 42-52 mm. long. Capsule apiculate, to 13 mm. long.

GENERAL DISTRIBUTION: Endemic to the Greater and Lesser Antilles.

DISTRIBUTION IN LESSER ANTILLES: Antigua!, Saba!, St. Eustatius, St. Kitts!, Montserrat!, Guadeloupe!, Dominica!, Martinique!, St. Lucia, St. Vincent!, the Grenadines, Grenada!, Barbados (reported by Gooding *et al.*).

OBSERVATION: Stehlé (Bull. Soc. Bot. France 123: 448. 1976) has published a key distinguishing several species which are considered to be synonymous by Read and by Smith and Downs; the latter treatment is followed in this text.

Pitcairnia bifrons (Lindley) R. W. Read in Phytologia 19: 277. 1970.

Basionym: *Bilbergia bifrons* Lindley in Jour. Hort. Soc. London 8: 54. 1853.

Type: *DeJonghe s.n.* and without locality, in Hort. Soc. London (CGE).

Syn.: *Pitcairnia bracteata* Aiton, Hort. Kew. ed. 2. 2: 202. 1811, nom. illeg.; Stehlé in Bull. Soc. Bot. France 123: 448. 1976.

Pitcairnia spicata forma *latior* L. B. Smith in Phytologia 15: 196. 1967.
(Type: St. Kitts, Howard 11945 (us).)

Leaves of mature rosettes over 70 cm. long, entire; blades narrowly lanceolate, attenuate, covered with silvery, adpressed scales. Scape erect, simple, densely flowered. Flowers divergent after anthesis; pedicels 4–13 mm. long; sepals 20–25 mm. long, lanceolate, acute to rounded; petals scarlet, 37–52 mm. long. Capsule not mature in any specimens seen.

GENERAL DISTRIBUTION: Endemic to the Lesser Antilles.

DISTRIBUTION IN LESSER ANTILLES: St. Kitts!, Guadeloupe!.

Pitcairnia micotrinensis R. W. Read in Phytologia 19: 278. 1970.

Type: Dominica, Read & Ernst 2018 (us).

Plants acaulescent or with stout stems to 20 cm. long. Leaves dimorphic, to 1.5 m. long; blades narrowly lanceolate, attenuate, entire, glabrous except for narrow line of scales. Scape erect, to 1.5 m., densely flowered, arachnoid-lepidote. Flowers spreading at anthesis and then reflexed; sepals rounded-apiculate, 19–29 mm. long; petals lanceolate, yellow to peach-colored, 45–55 mm. long. Fruit not described.

GENERAL DISTRIBUTION: Endemic to the Lesser Antilles.

DISTRIBUTION IN LESSER ANTILLES: Found only on the island of Dominica(!).

Pitcairnia spicata (Lam.) Mez in DC., Monogr. Phan. 9: 392. 1896.

Basionym: *Bromelia spicata* Lam., Encycl. Méth. Bot. 1: 146. 1783.

Type: French West Indies, Plumier *s.n.* (P).

Syn.: *Pitcairnia albucifolia* Schrader, Blumenb. 24, pl. 3. 1827. (Type: *Herrenhausen*, Hortus 1824 (GOET).)

Plants acaulescent. Leaves dimorphic; blades linear-lanceolate, 75 cm. long, with arching, pendulous apices, the surfaces covered with fimbriate

silvery scales. Scape erect. Inflorescence to 1 m. tall, simple, spicate, occasionally with small lateral branches, lepidote to glabrescent, densely flowered. Flowers with pedicels 8-11 mm. long; sepals 17-20 mm. long, rounded, apiculate; petals red, 42-47 mm. long. Capsule not described.

GENERAL DISTRIBUTION: Endemic to the Lesser Antilles.

DISTRIBUTION IN LESSER ANTILLES: Restricted to slope of Mt. Pelée, Martinique(!).

OBSERVATION: At lower elevations *P. spicata* hybridizes freely with *P. angustifolia*, producing a great variety of intermediate forms.

Pitcairnia sulphurea Andrews in Bot. Repos. 4: pl. 249. 1802.

Type: St. Vincent, *Anderson s.n.* (BM).

Syn.: *Pitcairnia bracteata* var. *sulphurea* (Andrews) Ker-Gawler in Curtis Bot. Mag. 34: t. 1416. 1811.

Pitcairnia spicata var. *sulphurea* (Andrews) Mez in DC., Monogr. Phan. 9: 393. 1896.

Tillandsia vincentiensis Krause in Beih. Bot. Centralbl. 32: 337. 1914. (Type: St. Vincent, *Krause 3498* (B).)

Pitcairnia spicata forma *pallida* L. B. Smith in Phytologia 15: 196. 1967. (Type: St. Vincent, *Morton 5252* (US).)

Plants acaulescent. Leaves of mature rosette 1 m. or more, entire, lanceolate-attenuate, with silvery, coalescent scales. Scape erect, unbranched, densely flowered. Flowers spreading after anthesis; pedicels 7-11 mm. long; sepals narrowly lanceolate, 21-25 mm. long with numerous irregular multicellular hairs, apically acuminate; petals yellow to white, 40-45 mm. long. Capsule not described.

GENERAL DISTRIBUTION: Endemic to the Lesser Antilles.

DISTRIBUTION IN LESSER ANTILLES: Found only on the island of St. Vincent(!).

TILLANDSIA Linnaeus

Tillandsia L., Sp. Pl. 1: 286. 1753.

Syn.: *Dendropogon* Raf., Neog. 3. 1825. (Type species: *Renalmia usneoides* L.)

Caulscent or acaulescent epiphytic herbs of variable habit. Leaves rosette or fasciculate or distributed along a stem, polystichous or distichous, entire, ligulate or subtriangular. Scape usually distinct. Inflorescence usually of distichous spikes, sometimes a single polystichous spike or rarely a single flower. Flowers perfect; sepals usually symmetrical, free or equally and posteriorly joined; petals free, naked or with vertical folds; stamens included or exserted; ovary superior, glabrous. Capsule septicidally dehiscent; seeds many, erect, narrowly cylindric or fusiform, the plumose appendage basal, straight, usually white.



FIGURE 89. Bromeliaceae. a, b, *Pitcairnia sulphurea*: a, habit, $\times 0.1$; b, inflorescence, $\times 0.5$. c, *Catopsis sessiliflora*, habit, $\times 0.2$. d, e, *Tillandsia*: d, *T. recurvata*, habit, $\times 0.5$. e, *T. bulbosa*, habit, $\times 0.5$.

TYPE SPECIES: *Tillandsia utriculata* L.

A genus of about 500 species occurring in warm climates in the Americas with only one species found in West Africa. For additional information, see L. B. Smith and R. J. Downs, Tillandsioideae, in *Flora Neotropica* 14: 667-1068. 1977.

KEY TO THE SPECIES

1. Leaves in 2 ranks; leaf blades slenderly cylindric; plants caulescent; stamens shorter than the petal claws, exceeding the pistil. 2
- 1a. Leaves in more than 2 ranks; leaf blades narrowly triangular, distinctly flattened at least at base; plants stemless; stamens at least equaling the petal claws. 3
2. Stem up to several meters long, exposed between alternating bunches of leaves; inflorescence pseudoaxillary, sessile, one-flowered. *T. usneoides*
- 2a. Stem not more than 10 cm. long, wholly covered by the imbricate leaf sheaths; inflorescence terminal, scapose, mostly more than one-flowered. *T. recurvata*
3. Flowers polystichous in a simple inflorescence; plant caulescent; stamens shorter than the petals. *T. tenuifolia*
- 3a. Flowers distichous in simple or compound inflorescences; plant stemless with fasciculate or rosulate leaves; stamens longer than the petals. 4
4. Leaf sheaths inflated and forming a pseudobulb, the inner ones closely enfolding the scape; flowers imbricate. *T. bulbosa*
- 4a. Leaf sheaths nearly flat, all divergent from the scape. 5
5. Floral bracts much less than twice as long as the internodes. 6
- 5a. Floral bracts at least twice as long as the internodes, usually imbricate. ... 7
6. Flowers erect, appressed to the rachis; leaves concolorous. *T. utriculata*
- 6a. Flowers spreading or subspreading; leaves usually cross-banded with white. *T. flexuosa*
7. Sepals exserted. *T. antillana*
- 7a. Sepals covered by the floral bracts. 8
8. Spikes linear-lanceolate, not more than 12 mm. wide; leaf sheaths scarcely if at all darker than the blades. *T. polystachya*
- 8a. Spikes lance-elliptic, ovate or oblong, 12-40 mm. wide; leaf sheaths much darker than the blades. *T. fasciculata*

Tillandsia antillana L. B. Smith in Contr. U. S. Natl. Herb. 29: 282. 1949.

Type: Guadeloupe, *Stehlé* 887 (vs).

Leaves 60 cm. long, densely and minutely lepidote. Inflorescence to 45 cm. long, slender, bipinnate, long-stipitate with imbricated sterile bracts; floral bracts twice as long as internodes, divergent, elliptic, 28 cm. long. Flowers with sepals free, lanceolate, longer than the bracts; petals 4 cm. long. Fruit not described.

GENERAL DISTRIBUTION: Jamaica and the Lesser Antilles.

DISTRIBUTION IN LESSER ANTILLES: Known only from fragmentary material collected at La Josephine au Matouba in Guadeloupe.

Tillandsia bulbosa Hooker, Exot. Fl. 3: pl. 173. 1826.

Type: *De Schach s.n.*, from a cultivated plant from Trinidad. No material preserved.

Bases of lower leaves inflated, often containing ants, bulbous, imbricated, 4-5 cm. broad above, abruptly narrowing into linear subterete-involute blades 7-25 cm. long, appressed-lepidote, spreading. Scape shorter than leaves. Inflorescence spicate, the spikes 1-6, compressed, densely flowered, 4-7 cm. long; floral bracts ovate-lanceolate, conduplicate, 1.0-1.5 cm. long, usually red. Flowers with sepals oval, 12 mm. long; petals 2.5 cm. long. Capsule cylindric, 3-4 cm. long; seeds 3 mm. long, the coma 2.0-2.5 cm.

GENERAL DISTRIBUTION: Mexico, Central America, Greater Antilles, Trinidad, South America.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe!, Martinique!.

Tillandsia fasciculata Sw., Prodr. 56. 1788; Fl. Ind. Occ. 1: 586. 1797.

Type: *Swartz s.n.* (s).

Plants usually clustered. Leaves lanceolate-attenuate, to 60 cm. long and 2 cm. wide above the sheath, upper leaves smaller and densely appressed-scurfy. Spikes subdigitate, compressed, 5-15 cm. long, 1-3 cm. wide, acute; floral bracts oblong, acute, appressed, 2-4 cm. long, red. Flowers with sepals lanceolate; petals blue, twice as long as sepals. Capsules 3 cm. long, pointed; coma 2.5 cm. long.

GENERAL DISTRIBUTION: Greater Antilles, Trinidad.

DISTRIBUTION IN LESSER ANTILLES: St. Martin, Sabal, Guadeloupe, La Desirade!, Dominica, St. Lucia, St. Vincent, the Grenadines.

OBSERVATIONS: Mez (Das Pflanzenr. IV, 32: 467, 468. 1935) described several varieties which occur in the Lesser Antilles. Smith and Downs (Fl. Neotropica 14: 947-952. 1977) recognize var. *unispica* (St. Lucia) and var. *venospica* (St. Vincent); the latter is also recognized by Stehlé (Bull. Soc. Bot. France 123: 449. 1976).

Tillandsia flexuosa Sw., Prodr. 56. 1788; Fl. Ind. Occ. 1: 590. 1797.

Type: Colombia, Jacq. Amer. 92, t. 73 (as *T. tenuifolia* Jacq., non L.). Smith and Downs (Fl. Neotropica 14: 977. 1977) cite a Jacquin specimen once in Vienna but now lost.

Leaves of rosette subbulbous, 20-50 cm. long, marked with broad white transverse stripes, pale-lepidote; blades narrowly triangular, acuminate and abruptly acute, stiff and curved, 25 cm. long. Inflorescence simple or laxly bipinnate, the branches to 40 cm. long, few-flowered, the rachis flexuous, sharply angled; floral bracts spreading, elliptic, acute, 2-3 cm. long, prominently nerved. Flowers with pedicels to 7 mm. long; sepals narrowly elliptic, obtuse, 2-3 cm. long, 7 mm. wide; petals linear, acute, to 4 cm.

long, white, rose, or purple; stamens exserted. Capsule slender, cylindric, to 7 cm. long; coma to 3.5 cm. long.

GENERAL DISTRIBUTION: South Florida, Greater Antilles, Central America, South America.

DISTRIBUTION IN LESSER ANTILLES: St. Vincent!, the Grenadines!, Grenada!.

Tillandsia polystachya (L.) L., Sp. Pl. ed. 2. 410. 1762.

Basionym: *Renealmia polystachya* L., Sp. Pl. 1: 286. 1753.

Type: West Indies, *Plumier s.n.* (P).

Syn.: *Tillandsia angustifolia* Sw., Prodr. 57. 1788. (Type: Jamaica, *Swartz s.n.* (BM).)

Plants solitary or clustered. Leaves linear to linear-filiform, often recurving above the dilated bases. Spikes erect, many-flowered; floral bracts ovate-oblong, erect or appressed. Flowers with sepals elliptic or linear-elliptic, 14–15 mm. long; petals twice as long as sepals, blue. Capsule cylindric-prismatic, 2.5–3.4 cm. long, acute.

GENERAL DISTRIBUTION: South Florida, Greater Antilles, Mexico, Central America, South America.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe!, La Desirade!, Dominica!, Martinique!, St. Lucia!, St. Vincent!.

COMMON NAME: Ananas sauvage.

Tillandsia recurvata (L.) L., Sp. Pl. ed. 2. 410. 1762.

Basionym: *Renealmia recurvata* L., Sp. Pl. 1: 287. 1753.

Type: Jamaica, *Sloane s.n.* (BM).

Stems often clustered, forming large masses, leaf-bearing portion 3–8 cm. long, terminated by a scapelike peduncle bearing 1–5 flowers. Leaves filiform, setaceous, covered with spreading scales. Scape terminal, to 13 cm. long. Floral bracts lanceolate, 1.0–1.5 cm. long. Flowers with sepals lanceolate, acute, shorter than bracts; petals blue. Capsule linear-prismatic, 2.0–2.5 cm. long.

GENERAL DISTRIBUTION: United States, Mexico, Central America, Greater Antilles, South America.

DISTRIBUTION IN LESSER ANTILLES: Anguilla!, St. Martin!, St. Barts!, Antigua!, Saba!, St. Eustatius!, St. Kitts!, Nevis!, Redonda!, Montserrat!, Guadeloupe!, Martinique!, St. Lucia!.

COMMON NAME: Old man's beard.

Tillandsia tenuifolia L., Sp. Pl. 1: 286. 1753; Smith in *Phytologia* 8: 219. 1962.

Type: *Von Royen s.n.* without locality (L).

Syn.: *Tillandsia pulchella* Hooker, Exot. Fl. 2: 154 (on plate). 1825; Duss, Fl. Phan. Ant. Fr. 574. 1897. (Type: *De Schach s.n.*, without locality (K).)

Tillandsia pulchra Hooker, Exot. Fl. 2: 154 (text). 1825; Stehlé in Bull. Soc. Bot. France 123: 449. 1976. (Type: Cultivated from Trinidad.)

Plants more or less caulescent with stems to 25 cm. long, often associated in large masses. Leaves densely polystichous, 5-10 cm. long; blades narrowly triangular, subulate, acuminate, appressed-lepidote. Scape slender, short, erect. Inflorescence simple, polystichous-flowered, ovoid; floral bracts exceeding sepals. Flowers with sepals lanceolate, acute, glabrous, 10 mm. long; petals clawed, the blade oblong, obtuse, 20 mm. long, blue, white, or rose; stamens shorter than petals. Capsule cylindric, 15 mm. long; coma 1 cm. long.

GENERAL DISTRIBUTION: United States, Mexico, Central America, South America.

DISTRIBUTION IN LESSER ANTILLES: Martinique!, St. Lucia!

Tillandsia usneoides (L.) L., Sp. Pl. ed. 2. 411. 1762.

Basionym: *Renealmia usneoides* L., Sp. Pl. 1: 287. 1753.

Lectotype: Jamaica, *Sloane s.n.* (BM).

Syn.: *Dendropogon usneoides* (L.) Raf., Neog. 3. 1825; Stehlé in Bull. Soc. Bot. France 123: 449. 1976.

Stems flexuous, hanging in festoons a meter or more in length, silvery-scurfy. Leaves scattered, 2-8 cm. long. Flowers sessile, solitary, rarely 2 together; sepals 6 mm. long, pale green; petals yellow. Capsule linear, 2-3 cm. long.

GENERAL DISTRIBUTION: Southeastern United States, Central America, Greater Antilles, South America.

DISTRIBUTION IN LESSER ANTILLES: St. Martin!, St. Barts!, Antigua!, Saba!, St. Eustatius, St. Kitts, Montserrat, Guadeloupe!, Dominica!, Martinique!, St. Lucia!, St. Vincent!, the Grenadines!.

COMMON NAMES: Barbe à negre, barbe à bois, queue de cheval, old man's beard.

Tillandsia utriculata L., Sp. Pl. 1: 286. 1753.

Lectotype: Jamaica, *Sloane s.n.* (BM).

Plants solitary, large, sometimes 2 m. high. Leaves to 70 cm. long, narrowly triangular, long-attenuate. Inflorescence much-branched, the branches long-ascending or nearly erect, the spikes few-flowered; floral bracts oblong, appressed, 1.5-3.0 cm. long. Flowers with sepals oblong, 2.0-2.5 cm. long; petals greenish-white or cream, shorter than the stamens. Capsules subcylindric, 4-5 cm. long.

GENERAL DISTRIBUTION: Mexico, Central America, Trinidad, Venezuela.

DISTRIBUTION IN LESSER ANTILLES: Anguilla!, St. Martin!, St. Barts!, Antigua!, Barbuda, Saba!, St. Eustatius!, St. Kitts!, Nevis!, Montserrat!, Guadeloupe!, La Desirade!, Dominica!, Martinique!, St. Lucia!, St. Vincent!, the Grenadines!, Grenada!.

COMMON NAMES: Ananas sauvage, ananas marron, wild pine.

DOUBTFUL SPECIES

Tillandsia brigitallis E. H. L. Krause (Beih. Bot. Centralbl. 32: 336. 1914) is based on *Wiegand 3497* collected in St. Vincent. In systematic treatments, Mez (Das Pflanzenr. IV, 32: 364. 1935), Smith (N. Am. Fl. 19(2): 156. 1938), and Smith and Downs (Fl. Neotropica 14: 1067. 1977) all failed to place this species due to discordant characters. A specimen has not been located.

VRIESEA Lindley

Vriesea Lindl. in Edw. Bot. Reg. 29: t. 10. 1843, nom. cons. emend.; Smith & Pittendrigh in Jour. Washington Acad. Sci. 43: 401. 1954, and Taxon 8: 232. 1959.

Syn.: *Thecophyllum* sensu Mez in Bull. Herb. Boiss. II, 3: 131. 1903, non André, 1889.

Neovriesia Britton in Britton & Wilson, Sci. Surv. Porto Rico 5: 141. 1923, nom. rej. (Type species: *Tillandsia psittacina* Hooker.)

Epiphytic herbs. Leaves densely rosulate, often banded or mottled. Inflorescence simple or paniculate, spikes usually distichous-flowered; floral bracts conspicuous, enfolding or concealing the bases of the flowers. Flowers with pedicels short or lacking; sepals free; petals free or very short-connate, bearing two scales each; stamens included or exserted; ovary superior to slightly inferior. Fruit capsular; seeds fusiform with long straight basal coma.

TYPE SPECIES: *Tillandsia psittacina* Hooker, correctly known as *Vriesea psittacina* (Hook.) Lindley.

A tropical American genus of about 190 species. See also: L. B. Smith and R. J. Downs, Tillandsioideae, in Fl. Neotropica 14: 1068-1275. 1977.

KEY TO THE SPECIES

1. Primary bracts much shorter than the branches. 2
- 1a. Primary bracts exceeding the branches; leaf-blades ligulate. 4
2. Leaf blades narrowly triangular, densely cinereous-lepidote; sepals acute, 10-12 mm. long. *V. didistichoides*
- 2a. Leaf blades ligulate or linear, inconspicuously punctulate-lepidote to glabrous. 3

3. Rachis verrucose below each node; floral bracts acuminate; inflorescence usually compound, lax. *V. ringens*
- 3a. Rachis smooth; floral bracts subacute; inflorescence simple, dense. *V. guadelupensis*
4. Flowers numerous, polystichous in a dense, subglobose cluster. *V. capituligera*
- 4a. Flowers 2-5, distichous. 5
5. Sepals 16 mm. long, exceeding the floral bracts; spikes 3-5-flowered. *V. cowellii*
- 5a. Sepals 8 mm. long, much shorter than the floral bracts; spikes 2-flowered. *V. antillana*

Vriesea antillana L. B. Smith & Pitt. in Jour. Washington Acad. Sci. 43: 403. 1954.

Based on: *Guzmania urbaniana* Mez in DC., Monogr. Phan. 9: 920. 1896, non *Vriesea urbaniana* Harms.

Type: Martinique, Duss 276 (B).

Syn.: *Thecophyllum urbanianum* (Mez) Mez in Bull. Herb. Boiss. II, 3: 131. 1903; Fournet, Fl. Guadeloupe Martinique 69. 1978.

Leaves in a dense rosette, up to 30 cm. long, 3-4 cm. wide, ligulate, acute, glabrous. Scape erect, stout, scape bracts imbricate, foliaceous. Inflorescence to 11 cm. long, few-flowered, with suberect, elliptic, red and green bracts exceeding axillary flowers; floral bracts ovate-oblong, obtuse, 3 cm. long. Flowers 2 in each axil; pedicels stout; sepals 8 mm. long, 10 mm. wide. Capsules 2.5-3.0 cm. long.

GENERAL DISTRIBUTION: Endemic to the Lesser Antilles.

DISTRIBUTION IN LESSER ANTILLES: Saba!, St. Kitts!, Montserrat!, Guadeloupe!, Dominica!, Martinique!.

Vriesea capituligera (Griseb.) L. B. Smith & Pitt. in Jour. Washington Acad. Sci. 43: 462. 1954.

Basionym: *Tillandsia capituligera* Griseb., Cat. Pl. Cub. 254. 1866.

Type: Cuba, Wright 3275 (GOET).

Syn.: *Guzmania capituligera* (Griseb.) Mez in DC., Monogr. Phan. 9: 926. 1896.

Thecophyllum capituligerum (Griseb.) L. B. Smith in Contr. Gray Herb. 98: 14. 1932.

Leaves in a dense rosette; blades ligulate, acuminate, up to 70 cm. long, 6-8 cm. wide, glabrous. Scape erect, stout, shorter than leaves; bracts imbricate, green and red. Inflorescence many-flowered, 30-50 cm. long, with spreading bracts, the spikes on stout stipes, subglobose, corymbose, 10-15-flowered; floral bracts elliptic or ovate, obtuse and apiculate, equaling or exceeding the sepals. Flowers with pedicels short, stout; sepals elliptic, obtuse, 2 cm. long; petals linear, obtuse, 28 mm. long, free, white. Capsule slenderly ellipsoid, 1.5-2.0 cm. long.

GENERAL DISTRIBUTION: Cuba, Jamaica, Hispaniola, Venezuela, Colombia, and Peru.

DISTRIBUTION IN LESSER ANTILLES: Nevis!, Guadeloupe!.

Vriesea cowellii (Mez & Britton) L. B. Smith in *Phytologia* 16: 80. 1968.

Basionym: *Tillandsia cowellii* Mez & Britton in Mez, in *Bull. Herb. Boiss.* II, 3: 225. 1903.

Type: St. Kitts, *Britton & Cowell 553* (B, NY!).

Plants 25-40 cm. high. Scape erect or pendulous, stout, subglabrous; bracts imbricate, broadly elliptic, acute, subinflated. Inflorescence compound, with simple branches, pinnate, compact, the primary bracts exceeding spikes, the spikes sessile, 3- to 5-flowered, 3 cm. long, 1 cm. wide; floral bracts ovate-elliptic, subobtusate, shorter than sepals. Flowers erect, subsessile; sepals subtriangular, to 16 mm. long, short-connate. Capsule short-beaked, about equal to sepals.

GENERAL DISTRIBUTION: Lesser Antilles and Venezuela.

DISTRIBUTION IN LESSER ANTILLES: A single collection, *Britton & Cowell 553* (NY!), from the summit of Mount Misery, St. Kitts.

Vriesea didistichoides (Mez) L. B. Smith in *Phytologia* 5: 281. 1955.

Basionym: *Tillandsia didistichoides* Mez in DC., *Monogr. Phan.* 9: 778. 1896.

Type: Trinidad, *Fendler 827* (BM).

Leaves many, clustered in a dense globular rosette, the sheaths inflated to form a large pseudobulb; blades linear-triangular, acuminate, 20-25 cm. long, 1-2 cm. wide at base, cinereous-lepidote. Scape decurved, slender; bracts erect, imbricate, ovate, inflated, red. Inflorescence subpinnately compound with simple branches, 10-23 cm. long; floral bracts erect, imbricate, elliptic, acute, 15 mm. long, exceeding the sepals, 3 times the length of internodes and concealing the rachis, bright red. Flowers erect; sepals elliptic, acute, 10-12 mm. long, glabrous, free; petals oblong, 2 cm. long, acute, lilac. Capsule slenderly cylindric, acute, 15 mm. long.

GENERAL DISTRIBUTION: Mexico, Cuba, Hispaniola, Trinidad, Venezuela.

DISTRIBUTION IN LESSER ANTILLES: Known only from a single collection made between Port Louis and Petit Canal, Guadeloupe, *Duss 3402* (NY!).

Vriesea guadelupensis (Baker) Mez in DC., *Monogr. Phan.* 9: 596. 1896.

Basionym: *Tillandsia guadelupensis* Baker, *Handb. Bromel.* 213. 1889.

Type: Guadeloupe, *Duchassaing s.n.* (B, now lost).

Syn.: *Neovriesia guadalupensis* Britton ex Stehlé, *Fl. Guadeloupe* 1: 212. 1936, illeg.

Neovriesia guadalupensis (Mez) Stehlé in *Bull. Soc. Bot. France* 123: 449. 1976, illeg.

Leaves 50 cm. long; blades linear, acuminate, 5 cm. wide. Scape erect; bracts densely imbricate, coriaceous, lowest foliaceous, others ovate. Inflorescence simple, 30 cm. long; floral bracts erect, not becoming secund with

the flowers, broadly ovate, acute, 5 cm. long, much exceeding the sepals. Flowers up to 26, suberect, becoming secund; pedicels short and stout; sepals ovate, acute, to 30 cm. long, 15 mm. wide; petals obtuse, 36 mm. long. Capsule to 2 cm. long, stout.

GENERAL DISTRIBUTION: Endemic to the Lesser Antilles.

DISTRIBUTION IN LESSER ANTILLES: Antigua!, Montserrat!, Guadeloupe!, Dominica!.

COMMON NAME: Ananas grandbois.

Vriesea ringens (Griseb.) Harms in Notizbl. Bot. Gart. Berlin **10**: 801. 1929.

Basionym: *Tillandsia ringens* Griseb., Cat. Pl. Cub. 255. 1866.

Type: Cuba, *Wright 1518*, in part (GOET).

Syn.: *Vriesea guadalupensis* sensu Boldingh, Fl. Dutch W. Ind. Isl. 34. 1909, non (Baker) Mez.

Epiphyte. Leaves variable, up to 60 cm. long, 6 cm. wide, brown punctate-lepidote. Scape erect; bracts imbricate, elliptic-lanceolate. Inflorescence laxly branched or rarely simple, to 30 cm. long, the branches suberect, secundly few-flowered, bearing several imbricate sterile bracts at base; floral bracts broadly ovate, acuminate, 30-65 mm. long, enfolding the flowers, exceeding the sepals. Flowers erect, to 8 cm. long; sepals elliptic, acuminate, to 35 mm. long, 13 mm. wide, subcoriaceous; petals white, coiling, recurved. Capsule stout, to 4 cm. long, 1 cm. in diameter, apiculate.

GENERAL DISTRIBUTION: Costa Rica, Panama, Greater Antilles.

DISTRIBUTION IN LESSER ANTILLES: Saba!, St. Eustatius!, Montserrat!, Guadeloupe!, Dominica!, Martinique!, St. Lucia!, St. Vincent!, Grenada!.

Fournet (Fl. Guadeloupe Martinique 70. 1978) reports that *Vriesea sintenisii* (as *Thecophyllum sintenisii*) was collected on the summit of the Soufrière, Guadeloupe, and that a specimen was so identified by L. B. Smith. No specimen from Guadeloupe is cited by Smith & Downs (Fl. Neotropica **14**: 1184. 1977).

Vriesea splendens Lem. is reported in cultivation by Fournet (Fl. Guadeloupe Martinique 73. 1978).

CULTIVATED SPECIES

Hohenbergia stellata Schult. f., cultivated at the Castleton Gardens in Jamaica in 1914 (*Harris 11711* (NY)), was "received from Martinique many years ago." No recent records are available to indicate current cultivation in the Lesser Antilles.

COMMELINACEAE

COMMELINACEAE R. Brown, Prodr. 268. 1810.

Perennial or annual herbs, succulent, erect, procumbent or repent and often rooting at the nodes. Leaves alternate, dilated or sheathed below, sessile or petiolate, entire. Inflorescence terminal, axillary or leaf-opposed. Flowers in simple or modified cymes or umbels, often subtended by spathe-like bracts; calyx of 3 persistent sepals; corolla of 3 membranous, often fugaceous, similar or dissimilar petals, one often greatly reduced; stamens 6 or fewer, all similar and perfect or several different and sterile, the filaments filiform or flattened, glabrous or variously pubescent, the anthers 2-celled, the connective variously elaborated; ovary superior, 2- or 3-celled, the ovules solitary or few in each cell, the style simple, the stigma terminal, entire or lobed. Fruit a loculicidal or indehiscent and crustaceous capsule, 2- or 3-celled.

TYPE GENUS: *Commelina* L.

A family of 38 genera and about 500 species of tropical and subtropical areas of the world. For further information about the family, see: P. Brennan, Classification of Commelinaceae, in Jour. Linn. Soc. Bot. **59**: 349-370. 1966; R. A. Howard, Nomenclatural notes on some Lesser Antillean Monocotyledoneae, in Jour. Arnold Arb. **60**: 290-301. 1979; H. Stehlé, Notes taxinomiques et ecologiques sur des monocotylédones nouvelles ou rares des Antilles françaises: Commelinaceae, in Bull. Soc. Bot. France **117**: 71-80. 1970.

KEY TO THE GENERA

1. Inflorescence subtended by or included in conspicuous spathaceous bracts. 2
 - 1a. Inflorescence without conspicuous spathaceous bracts. 7
2. Inflorescence terminal; bracts paired; stamens 6. 3
 - 2a. Inflorescence axillary or leaf-opposed. 5
3. Sepals and petals united in tubes at their bases; leaves silvery-striped above, pinkish-purple below; petals pink. *Zebrina*
- 3a. Sepals and petals free, not connate in tubes. 4
4. Foliage purple; petals rose; bracts paired. *Tradescantia*
- 4a. Foliage green; petals blue; spathes appearing scorpoid. *Cyanotis*
5. Plants appearing rosulate; leaves lanceolate or strap-shaped; inflorescence axillary, much shorter than the leaves; petals white; stamens 6, all perfect. *Rhoeo*
- 5a. Plants with stems elongate and leaves scattered; inflorescence leaf-opposed; perfect stamens 3; petals 3, two large and one smaller. 6
6. Flowers barely exerted from the bracts; petals blue; capsule dry, dehiscent; leaves less than 6 cm. long. *Commelina*
- 6a. Flowers borne on long peduncles, exerted from the bracts; petals white; fruit globose, white, indehiscent; leaves 17 cm. long, 6 cm. wide. ... *Commelinopsis*
7. Inflorescences mostly axillary. 8
 - 7a. Inflorescences terminal. 10

8. Flowers blue; stamens 6; leaves subsessile. *Cyanotis*
- 8a. Flowers white; stamens 1-3. 9
9. Inflorescence shorter than the subtending subsessile leaves; ovary pilose at the apex; anther connective well developed. *Callisia*
- 9a. Inflorescence much longer than the leaves which are narrowed to a petiolelike base; ovary glabrous; connective poorly developed. *Aploleia*
10. Corolla blue or bluish-purple. 11
- 10a. Corolla white or pink. 12
11. Anthers elongate, poricidal; seeds with arils; inflorescence racemose-paniculate; plants usually 1 m. or more tall, erect or scrambling. *Dichorisandra*
- 11a. Anthers longitudinally dehiscent; seeds without arils; flowers secund; plants prostrate-ascending, rooting at lower nodes. *Tinantia*
12. Inflorescence of sessile flowers in capitate clusters or double cincinni, these on long peduncles. *Tripogandra*
- 12a. Inflorescence cymose, flowers stalked in umbellate clusters. 13
13. Leaves linear-lanceolate, less than 1 cm. wide; seeds quadrate, angled, one per locule. *Leptorrhoeo*
- 13a. Leaves ovate-lanceolate; seeds rounded or truncate, two per locule. ... *Gibasis*

APLOLEIA Rafinesque

Aploleia Raf., Fl. Tell. 2: 17. 1837.

FIGURE 90a.

Stems repent or ascending, much branched, with branches penetrating from the nodal sheaths. Leaf blades green, ovate to lanceolate-ovate. Inflorescences axillary, composed of many sessile, paired, bracteate cincinni from the axils of leaves, reduced leaves, or sheaths on axillary branches. Flowers pedicellate, bracteolate; sepals 2 or 3, herbaceous; petals 2 or 3, deliquescent; stamens 1-3, the filaments glabrous, distinct, erect, the anthers ovate to linear, subsagittate at the base; ovary 2- or 3-locular, the ovules 2, uniseriate in each locule, the style short, the stigma penicellate. Capsule 2- to 4-valved with 2 striate seeds in each cell.

TYPE SPECIES: *Aploleia diffusa* Raf., nom. illeg., now correctly known as *Aploleia monandra* (Sw.) Moore.

A tropical New World genus of two species, closely related to *Tripogandra* and *Callisia* but differing in the structure of the androecium. For a full discussion of nomenclatural status, see H. E. Moore, Jr., The genus *Aploleia* (Commelinaceae), in Bailey 9: 13-19. 1961.

Aploleia monandra (Sw.) Moore in Bailey 9: 17. 1961.

Basionym: *Tradescantia monandra* Sw., Prodr. 57. 1788.

Type: Hispaniola, Swartz (s).

Syn.: *Callisia umbellulata* Lam., Illus. 1: 130, pl. 35, fig. 2. 1791; Griseb., Fl. Br. W. Ind. Isl. 524. 1864; Duss, Fl. Phan. Ant. Fr. 497. 1897. (Type: Lamarck, pl. 35, fig. 2.)

Callisia monandra (Sw.) Schultes in R. & S., Syst. Veg. 7: 1179. 1830.

Aploleia diffusa Raf., Fl. Tell. 2: 17. 1837, nom. illeg.

Stems weak, usually glandular-pilose above, rooting at the nodes and forming mats. Leaves subsessile; blades ovate to ovate-lanceolate, 2-4 cm.



FIGURE 90. Commelinaceae. a, *Apoleia monandra*, $\times 0.6$. b, *Callisia repens*, $\times 0.6$.

long, 1-2 cm. wide, the apex acuminate, the base rounded, the margin ciliate. Flowers umbellate; peduncles filiform, 1-3 cm. long, exserted from leaf-sheaths; sepals elliptic-oblong, 1.6-2.0 mm. long, 0.9-1.0 mm. broad, concave, glandular-pilose or glabrous dorsally, with scarious margins; petals lanceolate, smaller than the sepals, hyaline; stamens usually 1 or 2; ovary oblong-ellipsoid, compressed or angled, glabrous or pilose at apex, the style shorter than the capsule, the stigma 3-lobed. Capsule 1.0-1.3 mm. long, apiculate.

GENERAL DISTRIBUTION: Mexico, Central America, South America, Cuba, Hispaniola, Puerto Rico.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe!, Martinique!.

COMMON NAMES: Petit curage, petite herbe grasse.

CALLISIA Loeffling

Callisia Loeffl., Iter Hisp. 305. 1758.

FIGURE 90b.

Creeping or ascending herbs. Leaves pale green, the upper ones subsessile, vaginate; blades ovate to elliptic-lanceolate. Flowers sessile in axillary clusters; bracts similar to the leaves or reduced to sheaths; bractlets small; sepals 2 or 3, subequal, erect and persistent in fruit; petals 2 or 3, subequal or one smaller, marcescent; stamens 2 or 3, the filaments filiform, glabrous, the anther cells rounded and separated by connective tissue; ovary sessile, oblong, 2- or 3-celled, subtrigynous or subcompressed, pilose at apex, with 2 ovules in each cell, the style long, the stigma penicillate. Capsule membranous, 2- or 3-valved.

LECTOTYPE SPECIES: *Callisia repens* (Jacq.) L.

A tropical American genus of about ten species.

Callisia repens (Jacq.) L., Sp. Pl. ed. 2. 62. 1762.

Basionym: *Hapalanthus repens* Jacq., Enum. Syst. Pl. 12. 1760.

Type: Martinique, Jacquin, Select. Stirp. Am. Hist. pl. 11. 1763.

Slender, prostrate, often mat-forming stems, rooting at the nodes. Leaves ovate, 1-4 cm. long, 0.6-1.2 cm. broad, fleshy or succulent, the apex acuminate, the base rounded or subcordate, clasping, the margins ciliate; leaves of sterile shoots crowded or overlapping. Flowering branches upright; flowers in dense, sessile, axillary clusters more or less enclosed by the clasping leaf base; sepals linear-oblong, 3-4 mm. long, pilose dorsally with scarious margins; petals white, shorter than the green sepals; stamens 3, the anthers rounded; ovary pilose at the apex, the stigma trifid. Fruit capsular, oblong, 1.5 mm. long; seeds 6, 1 mm. long, dark brown, wrinkled.

GENERAL DISTRIBUTION: Cuba, Jamaica, Puerto Rico, Mexico, and South America.

DISTRIBUTION IN LESSER ANTILLES: St. Martin, St. Barts!, Antigua!, Saba!, St. Eustatius, St. Kitts!, Montserrat!, Guadeloupe!, Dominica!, Martinique!, St. Lucia!, St. Vincent!, the Grenadines!, Grenada!, Barbados.

COMMON NAMES: Oreillo di raton, yerba de awa.

Callisia fragrans (Lindl.) Woodson is reported from St. Martin by Broeders (Gek. Nutt. Plant. 129. 1971) but not documented by specimens. This stout, fleshy herb spreads by stolons and has stems to one meter tall, leaves to 25 cm. in length, and inflorescences commonly branched. It is cultivated and established in the Virgin Islands but has not yet been encountered in the Lesser Antilles.

COMMELINA Linnaeus

Commelina L., Sp. Pl. 1: 40. 1753.

FIGURE 91a.

Perennial or annual herbs with roots fibrous or tuberous; stems rhizomatous or with rhizomes bearing cleistogamous flowers. Leaves sessile or short-petiolate. Inflorescence cymose, subtended by spathe-like bracts. Flowers irregular, blue; sepals 3, unequal, the larger ones sometimes slightly united; petals 3, unequal, the larger 2 cucullate, the shorter one unguiculate or sometimes absent; stamens 6, with 3 (rarely 2) perfect, one of them incurved and its anther commonly larger, the other (usually 3) sterile stamens smaller than the fertile, cruciate-quadrifid, all with filaments glabrous; ovary sessile, glabrous. Capsule 3-celled; seeds 1 or 2 in each cell; testa smooth or reticulate.

LECTOTYPE SPECIES: *Commelina communis* L.

A genus of about 230 species found in tropical and subtropical climates throughout the world.

KEY TO THE SPECIES

1. Plants finely pubescent; stolons with cleistogamous flowers; leaves elliptic; spathe conical, fused. *C. benghalensis*
- 1a. Plants glabrous; leaves oblong or ovate-lanceolate; spathe broad, acute at one end. 2
2. Margins of spathe united below. *C. elegans*
- 2a. Margins of spathe free. *C. diffusa*

Commelina benghalensis L., Sp. Pl. 1: 41. 1753.

Type: Plukenet, Alm. 130, t. 27, f. 3. 1691.

Rhizomatous herb with basal leafless shoots producing cleistogamous flowers. Aerial stems decumbent or suberect, 60-100 cm. long, rooting at lower nodes, finely pubescent. Petioles and sheaths long-ciliate with red hairs; blades ovate, oblong, or elliptic, 4-8 cm. long, 1.5-3.0 cm. wide, apex acute, base narrowed and inequilateral, puberulent or villose on both surfaces. Spathes slightly funnel-shaped, auriculate on one side, 1.0-1.5 cm. long, minutely pubescent, margins joined toward the base; sepals small, oblong, pubescent; petals orbicular, blue. Capsule 3-celled, 5-seeded; seeds minutely roughened and pitted.

GENERAL DISTRIBUTION: Asia, Cuba, Jamaica.

DISTRIBUTION IN LESSER ANTILLES: Montserrat!, Martinique!, St. Vincent!, Barbados!.

COMMON NAME: Herbe grasse.

Commelina diffusa Burm., Fl. Ind. 18: t. 7, f. 2. 1768; Merrill in Jour. Arnold Arb. 18: 64. 1937.

Type: *Burman Herb*.

Syn.: *Commelina longicaulis* Jacq., Coll. 3: 234. 1789. (Type: Jacq., Ic. Pl. Rar. 2: t. 294. 1797.)

Commelina cayennensis Rich. in Acta Soc. Hist. Nat. Paris 1: 106. 1792; Griseb., Fl. Br. W. Ind. Isl. 524. 1864; Duss, Fl. Phan. Ant. Fr. 498. 1897. (Type: *LeBlond*.)

Perennial herbs; stems glabrous, decumbent or ascending, rooting at the nodes. Leaves with scarious, ciliate sheaths; blades ovate-lanceolate, 2-5 cm. long, 1-2 cm. wide, the apex acute or acuminate, the base rounded. Spathes ovate-lanceolate, 1-2 cm. long, acute or acuminate, not united at the base, margins finely ciliate; sepals 3-4 mm. long, green, scarious on margins; petals heteromorphic, upper two 4-5 mm. long, blue, lower petal shorter or wanting. Capsule 3-celled, upper cell with 1 seed, lower 2 cells each 2-seeded; seeds black, reticulate.

GENERAL DISTRIBUTION: Greater Antilles, Central America, South America.

DISTRIBUTION IN LESSER ANTILLES: Antigua!, St. Kitts!, Montserrat!, Guadeloupe!, Marie Galante!, Dominica!, Martinique!, St. Lucia!, St. Vincent!, Grenada!, Barbados!.

COMMON NAMES: Water grass, French weed, curage, herbe grasse.

Commelina elegans Kunth, Nov. Gen. Sp. 1: 206. 1815.

Type locality: Colombia.

Syn.: *Commelina virginica* auct., non Linnaeus.

Perennial herbs with stems slender, decumbent to erect, glabrous. Leaf blades lanceolate to narrowly elliptic or oblong-lanceolate, 3-8 cm. long, 1.0-2.5 cm. wide, acute or acuminate at apex, rounded at base, the sheaths minutely white-ciliate on margins and apex. Spathes 2.5-3.5 cm. long, glabrous or minutely pubescent, acute, the margins joined toward the base; sepals 4-5 mm. long; petals 1.0-2.5 cm. long, blue to bluish-white, or rarely pure white. Capsule 4-5 mm. long, 3-seeded; seeds gray-brown, smooth or puberulent.

GENERAL DISTRIBUTION: Mexico, Central America, Greater Antilles, Trinidad, South America.

DISTRIBUTION IN LESSER ANTILLES: Anguilla!, St. Martin, St. Barts!, Antigua!, Barbuda!, Saba, St. Eustatius!, St. Kitts!, Nevis, Montserrat!,

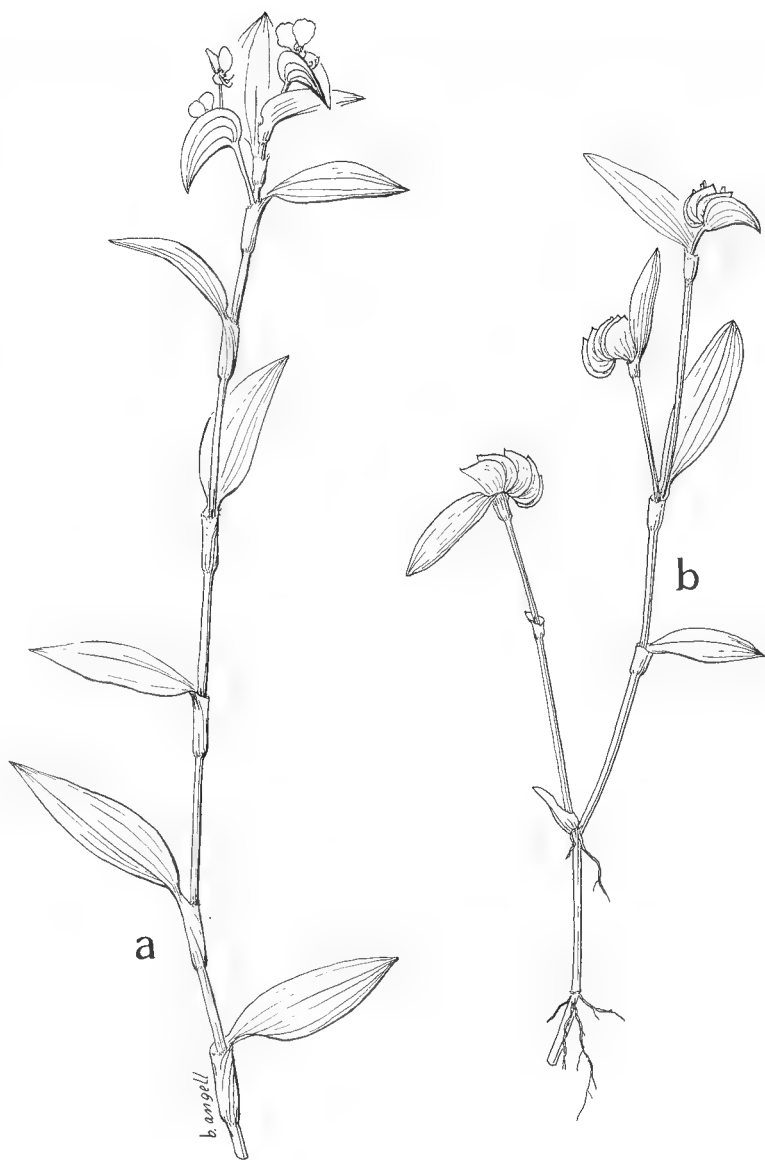


FIGURE 91. Commelinaceae. a, *Commelina diffusa*, $\times 0.4$. b, *Cyanotis cristata*, $\times 0.6$.

Guadeloupe!, Dominica!, Martinique!, St. Lucia!, St. Vincent!, the Grenadines!, Grenada!, Barbados!.

COMMON NAMES: Pond grass, water grass, curage, herbe grasse.

OBSERVATIONS: Recently, C. K. Brashier (Bull. Torrey Bot. Club 93: 1-19. 1966) published a revision of *Commelina* species in the United States. No consideration was given to extra-territorial records or references, and *Commelina elegans* Kunth was accepted as a synonym of *Commelina virginica* L. without discussion. The treatment used here is conventional and in accord with recent tropical floras. A careful study of tropical populations would be most useful.

A variegated leaf form striped with white has been collected on Montserrat (Howard 17477 (A) and St. Lucia (Sturrock A-189 (A)) from cultivated ground cover. No subspecific or cultivar name has been found for this plant.

COMMELINOPSIS M. Pichon

Commelinopsis Pichon in Not. Syst. Paris 12: 227. 1946. FIGURE 92.

Perennial herbs, stems erect to procumbent, subpilose. Leaf blades lanceolate, narrowed at base, subpetiolate. Cymules simple, glomerate if more than 1, short-pedunculate to subsessile, subtended by a single cymbiform spathe. Flowers perfect, obliquely zygomorphic, bracteolate; sepals 3, free or slightly fused at base; petals 3, free, unequal; fertile stamens 3, free, unequal, with glabrous filaments, staminodia 3, unequal, glabrous; ovary glabrous, 3-locular, with 2 ovules in each of two locules and 1 in a third. Fruit indehiscent, crustaceous, white; seeds exarillate, pubescent.

TYPE SPECIES: *Commelinopsis persicariifolia* (DC.) Pichon.

A monotypic genus, the single species occurring only in the New World tropics.

Commelinopsis persicariifolia (DC.) Pichon in Not. Syst. Paris 12: 227. 1946.

Basionym: *Commelina persicariaefolia* DC. in Redoute, Lil. 8, pl. 472. 1816.

Type: Redoute, pl. 472, from a plant cultivated at the Jardin du Museum d'Histoire Naturelle.

Syn.: *Phaeosphaerion persicariaefolium* (DC.) C. B. Clarke in DC., Monogr. Phan. 3: 137. 1881.

Athyrocarpus persicariaefolius (DC.) Hemsl. in Biol. Centr. Amer. 3: 386. 1885.

Stems branching, prostrate or ascending, rooting at lower nodes. Leaf blades lanceolate, 14-19 cm. long, 5-6 cm. broad, acuminate at apex, unequally cuneate at the base, glabrous, the sheaths closed. Inflorescences with short peduncles; spathes conduplicate, the valves semiorbicular, 3-4 cm. long; sepals 5 mm. long, 2-3 mm. broad; petals clawed, white. Fruit ellipsoidal or subglobose, 5.5-6.0 mm. long, 4.5-5.0 mm. broad, crustaceous,



FIGURE 92. Commelinaceae. a, b, *Commelinopsis perisicariifolia*: a, habit, showing inflorescence, $\times 0.3$; b, inflorescence with fruit, $\times 0.3$.

grayish-white, shining, the anterior cells of the capsule 2-seeded; seeds superposed, truncate, posterior cell with 1 large seed.

GENERAL DISTRIBUTION: Cuba, Hispaniola, Puerto Rico, Trinidad, northern South America.

DISTRIBUTION IN LESSER ANTILLES: Known from only two collections from Grenada (*Broadway 1868*, collected in 1906, and *Proctor 17644*, collected in 1957), which, with the material from Trinidad, may represent a distinct species on the basis of broader leaves and larger spathes.

CYANOTIS D. Don

Cyanotis D. Don, Prodr. Fl. Nepal. 45. 1825, nom. cons. FIGURE 91b.

Branched herbs, prostrate to suberect, rooting at the nodes. Leaves narrow-oblong, clasping at the base. Inflorescence in dense axillary or terminal clusters, more or less enclosed in spathe-like bracteoles and in bracts. Flowers slightly irregular, blue; sepals 3, mostly free; petals 3, free or joined near the base; stamens 6, all similar, the filaments glabrous or pubescent; ovary 3-celled, 2 ovules in each cell. Capsule 3-valved.

TYPE SPECIES: *Cyanotis barbata* D. Don.

A tropical Old World genus comprised of about 50 species.

KEY TO THE SPECIES

1. Cymes enclosed in biseriate, falcate, imbricated bracteoles, the whole inflorescences appearing scorpioid. *C. cristata*
- 1a. Cymes enclosed in the sheaths of the leaves; bracts small. *C. cucullata*

Cyanotis cristata (L.) D. Don, Prodr. Fl. Nepal. 46. 1825.

Basionym: *Commelina cristata* L., Sp. Pl. ed. 2. 42. 1762.

Type: Not selected.

Stems creeping, branches erect or ascending, to 50 cm. long, glabrous or with spreading hairs. Leaves ovate-oblong, 4–8 cm. long, 1–2 cm. wide, the apex acute, the base sessile. Inflorescences mostly terminal, the primary bracts spathe-like, longer than the cymes; bracteoles 1.0–1.5 cm. long, falcate, acute; sepals lanceolate, narrower than the petals; petals blue; filaments bearded. Capsule 8 mm. long, obtuse at the apex; seeds striate and pitted.

GENERAL DISTRIBUTION: Native of Asia.

DISTRIBUTION IN LESSER ANTILLES: *Duss 4560, 3285* (NY!), a collection from Martinique misidentified as a *Commelina*, was reported as introduced and naturalized in 1900. The only recent collection (*Proctor 19143* (A!)) was growing as a weed in cotton fields near Silver Hill, Montserrat.

Cyanotis cucullata (Roth) Kunth, Enum. Pl. 4: 107. 1843.

Basionym: *Tradescantia cucullata* Roth, Nov. Sp. 189. 1821.

Type: India orientali, *Heynii*.

Stems suberect or decumbent, glabrous. Leaves linear-oblong, 3-8 cm. long, 0.5-1.0 cm. wide, apex acute or acuminate, slightly falcate, base sessile. Flowers blue; filaments nearly glabrous. Capsule 3-horned with center of apex depressed, 5 mm. long, 3 mm. thick; seeds subquadrate.

GENERAL DISTRIBUTION: Asia.

DISTRIBUTION IN LESSER ANTILLES: Antigua!, Barbados!.

OBSERVATIONS: Little material is available for comparison and verification of this identification.

The Antiguan material was once called *C. axillaris* (L.) D. Don, distinguished by bearded stamens, an acute capsule and subcylindric seeds.

DICHORISANDRA Mikan

Dichorisandra Mikan, Del. Fl. Faun. Bras. t. 3. 1820, nom. cons.

Large perennial herbs, stems simple or branched, erect or scandent. Leaves broad, sheaths closed. Inflorescence terminal, racemose or paniculate. Flowers regular; sepals 3, free, oblong-elliptic, green, persistent; petals 3, free, blue or purple, marcescent; stamens 6, the filaments short, glabrous, the anthers elongate, dehiscent by apical pores; ovary 3-celled, ovules 4 or 5 per cell. Capsule ovoid, 3-celled, loculicidally 3-valvate; seeds several per cell, covered with fleshy aril.

TYPE SPECIES: *Dichorisandra thyrsiflora* Mikan.

A genus of about 35 species occurring throughout tropical America.

KEY TO THE SPECIES

- 1. Inflorescence short; anthers blue. *D. hexandra*
- 1a. Inflorescence long-peduncled; anthers yellow; cultivated. *D. thyrsiflora*

Dichorisandra hexandra (Aubl.) Standley in Standley & Calderon, Lista Pub. Pl. El Salvador 48. 1925.

Basionym: *Commelina hexandra* Aubl., Pl. Guian. 1: 35, pl. 12. 1775.

Lectotype: Aublet, Pl. Guian. 1: pl. 12 (Specimen reported to be in *Hb. Denaisse*, vol. 1: 49. (P, n.v.).)

Syn.: *Dichorisandra aubletiana* R. & S., Syst. Veg. 7: 1181. 1830, nom. illeg.; Duss, Fl. Phan. Ant. Fr. 499. 1897; Stehlé in Bull. Soc. Bot. France 123: 450. 1976.

Climbing or semiscandent herb to 5 m. tall with glabrous stems. Leaves oblong-elliptic to elliptic-lanceolate, 6-18 cm. long, 2-7 cm. wide, acuminate

at apex, cuneate or narrowed at base. Inflorescences racemose-paniculate, 4-8 cm. long, sessile or peduncled, multiflowered; sepals 6-8 mm. long, glabrous; petals oblong-obtuse, blue or bluish-purple, 10-13 mm. long; anthers blue. Capsule 10-12 mm. long; seeds 4-5 in each cell, aril orange-yellow.

GENERAL DISTRIBUTION: Mexico, Central America, South America.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe; known only from the single collection made by Duss (1019, NY!) in the ravine at Macoube in 1878.

COMMON NAME: Herbe-ravine.

GIBASIS Rafinesque

Gibasis Raf., Fl. Tell. 2: 16. 1837.

FIGURE 93a.

Branched procumbent herbs. Leaves linear to oblanceolate, often pilose with glandular hairs. Inflorescence terminal and in axils of upper leaves, branched to form panicles or corymbs, few- or many-flowered; bracts leaf-like. Flowers pedicellate; sepals 3, free, glabrous or pilose, persistent in fruit; petals 3, free, equal; stamens 6, all fertile or 3 fertile and 3 sterile, the filaments usually pubescent; ovary glabrous or pilose, 3-locular, ovules 2 per locule. Capsule apically dehiscent into 3 valves; seeds rugose.

TYPE SPECIES: *Gibasis pulchella* (H. B. K.) Raf., based on *Tradescantia pulchella* H. B. K.

A genus of six species distributed in Mexico and the West Indies, with one species occurring in India.

Gibasis geniculata (Jacq.) Rohweder in Univ. Hamb. Abh. Geb. Ausl. 61, Naturw. 18: 143. 1956.

Basionym: *Tradescantia geniculata* Jacq., Enum. 18. 1760, Select. 94, t. 64. 1763; Duss, Fl. Phan. Ant. Fr. 495. 1897.

Lectotype: Plumier, Pl. Amer. 116, f. 2. 1757.

Syn.: *Aneilema geniculata* (Jacq.) Woods. in Ann. Missouri Bot. Gard. 29: 147. 1942.

Semitrailing, diffusely branched herb, rooting at the lower nodes. Leaves ovate to ovate-lanceolate, mostly 3-7 cm. long, 1-3 cm. wide, apex acute, blades usually lightly pubescent on both sides, basal sheaths pilose-ciliate. Inflorescence peduncles 2.5-5.0 cm. long, glabrous, loosely cymose or seemingly paniculate; pedicels filiform, 4-12 mm. long; sepals lanceolate, 2-3 mm. long, green with barbate tip; petals 3-5 mm. long, white; filaments villose. Capsule 2-3 mm. long; seeds 1 mm. long, gray, obscurely rugose.

GENERAL DISTRIBUTION: Mexico, Central America, Hispaniola, Puerto Rico, Trinidad.



FIGURE 93. Commelinaceae. a, *Gibasis geniculata*, $\times 0.6$. b, *Leptorrhoeo filiformis*, $\times 0.6$.

DISTRIBUTION IN LESSER ANTILLES: St. Martin!, Antigua!, Guadeloupe!, Dominica!, Martinique!, St. Lucia!, St. Vincent!, the Grenadines!, Grenada!, Barbados!.

COMMON NAMES: Curage des bois, herbe grasse des bois.

OBSERVATIONS: Grisebach (Fl. Br. W. Ind. Isl. 523. 1864) recognized the Dominican *Tradescantia geniculata* var. *effusa* (Mart.) Griseb. (basionym, *T. effusa* Mart. in R. & S., Syst. Veg. 7: 1159. 1830; syn., *T. floribunda* Kunth, Enum. Pl. 4: 89. 1843) on the basis of longer and less hairy leaves. Without citing specific collections, Duss (Fl. Phan. Ant. Fr. 495. 1897) recognized this and two other unnamed varieties from Martinique. The variation in leaf size, shape and pubescence does not seem worthy of nomenclatorial distinction.

LEPTORRHOEO C. B. Clarke

Leptorrhoeo C. B. Clarke in Hemsley, Diagn. Pl. Nov. 55. 1880.

FIGURE 93b.

Delicate annual herb. Leaves lanceolate, sessile. Inflorescence cymose, pedunculate; peduncles axillary and terminal, filiform; cymes small, fascicled; bracts small. Flowers on filiform pedicels; sepals 3, subequal, free; petals 3, free, ovate, subequal; stamens 6, hypogynous, all or mostly all perfect, the filaments filiform, glabrous, the anther loculi curved; ovary sessile, 3-loculed, with one ovule per cell. Capsule ovoid, loculicidally dehiscent; seeds solitary, subquadrate; testa foveolate-rugose.

TYPE SPECIES: *Leptorrhoeo filiformis* (Mart. & Gal.) C. B. Clarke.

A genus of three species with distribution restricted to the New World.

OBSERVATIONS: The Index Nominum Genericorum card suggests the genus and the type species are both illegitimate. For a discussion of the taxa involved and their assignment, see W. L. Handlos, The taxonomy of *Tri-pogandra* (Commelinaceae), in *Rhodora* 77: 219, 280, 286. 1975.

Although Clarke originally spelled the generic name "*Leptorhoeo*," current workers have followed the spelling "*Leptorrhoeo*" of Brenan (Jour. Linn. Soc. Bot. 59: 368. 1966).

Leptorrhoeo filiformis (Mart. & Gal.) C. B. Clarke in Hemsley, Diagn. Pl. Nov. 55. 1880.

Basionym: *Tradescantia filiformis* Martens & Galeotti in Bull. Acad. Roy. Sci. Bruxelles 9: 376. 1842.

Type: Mexico, *Galeotti* 4957.

Delicately branching, creeping annual herb with stems to 25 cm. long. Leaves lanceolate-linear, 2-3 cm. long, up to 5 mm. wide, the apex acuminate to acute, the base clasping, the sheath short. Inflorescences terminal and lateral; peduncle 1-4 cm. long; bracts minute; pedicels 3 mm. long.

Flowers appearing subumbellate; sepals 3 mm. long; petals slightly shorter, bright pink. Capsule ovoid, 2 mm. in diameter; seeds sharply angled, 1.2 mm. long.

GENERAL DISTRIBUTION: Mexico to Brazil.

DISTRIBUTION IN LESSER ANTILLES: Known only from *B. M. Sturrock* 759 (A1) collected at La Toc, St. Lucia, in September and November. The plant appears to be ephemeral, appearing after the dry season.

RHOEO Hance in Walpers

Rhoeo Hance in Walpers, Ann. Bot. 3: 659. 1853. FIGURE 94a.

Short-stemmed, rosulate, fleshy, generally glabrous herbs. Leaves elongate, strap-shaped, concolorous or bicolorous. Inflorescence axillary; peduncles much shorter than the leaves, simple or branched. Flowers almost concealed in paired colored bracts, umbellate; sepals 3, petaloid, distinct; petals 3, white; stamens 6, nearly equal, fertile, the filaments pilose; ovary 3-celled, ovules solitary in each cell. Capsule loculicidally 3-valved; seeds ellipsoidal, rugose.

TYPE SPECIES: *Rhoeo discolor* (L'Herit.) Hance in Walpers, now correctly known as *Rhoeo spathacea* (Sw.) Stearn.

A monotypic genus, the sole species distributed in the New World tropics.

Rhoeo spathacea (Sw.) Stearn in Bailey 5: 195. 1957.

Basionym: *Tradescantia spathacea* Sw., Prodr. 57. 1788.

- Type: "India occidentalis, Campechia."

Syn.: *Tradescantia discolor* L'Herit., Sert. Angl. 8, pl. 12. 1788-1789; Griseb., Fl. Br. W. Ind. Isl. 524. 1864; Duss, Fl. Phan. Ant. Fr. 496. 1897. (Type: Cultivated plant represented by L'Herit., pl. 12.)

Rhoeo discolor (L'Herit.) Hance in Walpers, Ann. Bot. 3: 660. 1853.

Tradescantia discolor var. *variegata* Hooker in Curtis Bot. Mag. 84: t. 5079. 1858. (Type: Cultivated plant represented by t. 5079.)

Rhoeo spathacea forma *variegata* (Hook.) Stehlé in Bull. Soc. Bot. France 117: 77. 1970.

Tradescantia discolor var. *concolor* Baker in Saunders, Ref. Bot. 1: t. 48. 1868. (Type: Cultivated plant represented by t. 48.)

Rhoeo spathacea forma *concolor* (Baker) Stehlé in Bull. Soc. Bot. France 117: 77. 1970.

Plants often clustered or forming large colonies; stems stout, to 20 cm. high. Leaves few, nearly erect, 20-35 cm. long, 3-5 cm. wide, linear-lanceolate to oblong-lanceolate, apex acuminate, usually dark green above, red-purple beneath, fleshy. Inflorescence axillary, peduncles 2-4 cm. long; bracts compressed, 3.0-4.5 cm. broad, 2-3 cm. high, acute, many-flowered; petals white, 5-8 mm. long. Capsule obtusely 3-angled, to 4.5 mm. long.

GENERAL DISTRIBUTION: Mexico, Central America, Greater Antilles.



FIGURE 94. Commelinaceae. a, *Rhoeo spathacea*, $\times 0.3$. b, *Tradescantia pallida*, $\times 0.3$.

DISTRIBUTION IN LESSER ANTILLES: St. Barts, Antigua!, Saba!, Guadeloupe!, Martinique!, St. Lucia!, St. Vincent!, the Grenadines!, Grenada!, Barbados!.

COMMON NAMES: Canoa di San Pedro, Indján den boto, Moses in the basket, ladies in a boat, gros curage, grosse herbe grasse.

TINANTIA Scheidweiler

Tinantia Scheidw., Allg. Gartenz. 7: 365. 1839, nom. cons. FIGURE 95.

Erect annual herbs, simple or branched. Leaf blades mostly elliptic, large, pubescent. Inflorescence solitary and terminal, cymose or subumbellate, pedunculate. Flowers pedicillate, borne in racemose to subumbellate clusters at the end of each peduncle, bracteolate; sepals 3, free, erect and persistent in fruit; petals 3, short-unguiculate, elliptic, blue or purple, marcescent; stamens 6, all fertile, 3 long and naked above, 3 short and pubescent at the middle; ovary sessile, 3-celled, ovules 2 per cell. Capsule dry, 3-celled, valvate, seeds 2 per cell; testa rugose-roughened.

TYPE SPECIES: *Tinantia fugax* Scheidweiler, now correctly known as *T. erecta* (Jacq.) Schlechtendal.

A genus of eight species distributed from Mexico to tropical South America and the West Indies.

Tinantia caribaea Urban, Symb. Antill. 3: 280. 1902.

Type: Syntypes cited, no lectotype chosen.

Annual herb up to 1.5 m. tall, stem glabrous to sparingly pilose. Leaves with pilose sheaths, petiole 1.0–1.5 cm., blades ovate-elliptic to ovate, 10–18 cm. long, 4–6 cm. wide, the apex acuminate, the base rounded and narrowed to petiole, the margins ciliate. Cymes, terminal, few-flowered, the peduncles 3–10 cm. long, pilose; sepals green, ovate-oblong, 6–7 mm. long, 3.0–3.6 mm. wide, long-pilose; petals suborbicular, 7–8 mm. long, purple to lilac; ovary biovulate. Capsule oval, 5–7 mm. long; seeds rugulose.

GENERAL DISTRIBUTION: Endemic to the Lesser Antilles.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe!, Martinique!.

OBSERVATIONS: Urban cited the collections *Duss* 3417 and 4523 from Trois-Ponts near Basse-Terre, Guadeloupe, and *Duss* s.n. and without location from Martinique. Stehlé (Bull. Soc. Bot. France 117: 75. 1970) reported that he searched for this plant frequently between 1925 and 1964 without success. No recent collections are known.

TRADESCANTIA Linnaeus

Tradescantia L., Sp. Pl. 1: 288. 1753.

FIGURE 94b.

Perennial herbs with simple or branched stems. Inflorescence of showy or sometimes inconspicuous regular flowers in terminal or terminal and



FIGURE 95. Commelinaceae. *Tinantia caribaea*, $\times 0.5$.

axillary umbellike cymes subtended by leaflike or scarious bracts; sepals 3, herbaceous, free, persistent; petals 3, sessile, equal; stamens 6, all alike and fertile or those opposite the petals shorter, the filaments bearded or glabrous; ovary 3-celled, the cells 2-ovuled. Capsule 3-celled, loculicidally 3-valved; seeds rugose-reticulate.

TYPE SPECIES: *Tradescantia virginiana* L.

An American genus of 60 species distinguished by the presence of six perfect stamens.

Tradescantia pallida (Rose) Hunt in Kew Bull. 30: 443. 1976.

Basionym: *Setcreasea pallida* Rose in Contr. U. S. Natl. Herb. 13: 294. 1911.

Type: Mexico, Palmer s.n. (US 572818).

Syn.: *Setcreasea purpurea* Boom in Acta Bot. Neerl. 4: 167. 1955; Fournet, Fl. Guadeloupe Martinique 82. 1978. (Type: From a cultivated plant, Boom 28046.)

Perennial herb 30-50 cm. long, with suberect or ascending branches. Leaf sheaths amplexicaulous, 1.0-2.5 cm. long, ciliate-margined; blades oblong, acute, 14-18 cm. long, 2.0-3.5 cm. broad, shorter above, glaucous. Inflorescences cymose, involucre leaves 2 or 3, similar to leaves but smaller; umbellate pedicels to 7 mm. long, glabrous below, pilose above; sepals oblong, 8-10 mm. long; petals 15-20 mm. long, rose-purple; stamens 6, with 3 filaments epipetalous and 3 adherent to petal margins, variably pubescent or glabrous. Fruit unknown.

GENERAL DISTRIBUTION: Mexico and Central America.

DISTRIBUTION IN LESSER ANTILLES: Cultivated or escaped from cultivation in St. Martin, Saba, St. Eustatius, Guadeloupe, Martinique, and St. Lucia!

COMMON NAME: Purple heart.

TRIOGANDRA Rafinesque

Tripogandra Raf., Fl. Tell. 2: 16. 1837.

FIGURE 96a.

Perennial succulent herbs; stems simple or branched, trailing to suberect, often with long adventitious roots. Leaves with sheathing base, linear to ovate. Inflorescence axillary, long-pedunculate; bracts small, oblong. Flowers in double cincinni; sepals 3, free; petals 3, free, white or colored; stamens 6, dimorphic, fertile, the outer 3 shorter, the inner 3 longer, filaments pilose or glabrous; ovary 3-celled, each 1- or 2-ovulate. Capsule 3-celled, each cell 1- or 2-seeded; seeds trigonal, reticulate.

TYPE SPECIES: *Tripogandra multiflora* (Sw.) Raf., based on *Tradescantia multiflora* Sw.

A genus of about 20 species, occurring in tropical America. For more information, see W. L. Handlos, The taxonomy of *Tripogandra*, in Rhodora 77: 263-337. 1975.

***Tripogandra serrulata* (Vahl) Handlos in Bailey** 17: 33. 1970.

Basionym: *Commelina serrulata* Vahl, Eclog. 2: 4. 1798.

Type: *Ryan*, probably from Montserrat (c).

Syn.: *Tradescantia elongata* G. F. W. Meyer, Fl. Esseq. 146. 1818; Griseb., Fl. Br. W. Ind. Isl. 524. 1864; Duss, Fl. Phan. Ant. Fr. 496. 1897; Fournet, Fl. Guadeloupe Martinique 85. 1978. (Type: lost.)

Tripogandra elongata (Meyer) Woods. in Ann. Missouri Bot. Gard. 29: 152. 1942.

Stems purplish, slender, creeping, to 60 cm. long. Sheaths ciliate; leaves lanceolate to lance-ovate, 3-8 cm. long, 1.5-2.3 cm. broad, acute or acuminate at apex, narrowed or rounded at base, streaked with purple, the margins minutely serrulate, the sheaths ciliate. Flowers with sepals elliptic, 3.0-3.5 mm. long, 2.25 mm. wide, obtuse; petals pink; staminal filaments villous, the anthers dimorphic. Capsule 3 mm. long; seeds gray, pitted.

GENERAL DISTRIBUTION: Mexico, Central America, Hispaniola, Puerto Rico, Trinidad, South America.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe!, Dominica!, Martinique!, St. Vincent!.

COMMON NAMES: Curage-rivière, herbe grasse rivière.

ZEBRINA Schnizlein

***Zebrina* Schnizl. in Bot. Zeit. 7: 870. 1849.**

FIGURE 96b.

Succulent, branched, prostrate or trailing perennial herbs. Leaf sheaths conspicuous, villous and ciliate, the blades ovate, variegated above, purplish below. Flowers scarcely exserted from leaflike bracts, subsessile; sepals 3, connate below into a tube, petaloid or scarious; petals 3, connate into a slender tube below, blades ovate, rose-purple; stamens 6, all fertile, the filaments pubescent or glabrous; ovary 3-celled, ovules 2 per cell. Capsule on short recurved stipe; seeds 1-2 per cell, somewhat rugulose.

TYPE SPECIES: *Zebrina pendula* Schnizl.

A genus of four or five species ranging from the southern United States to Central America.

***Zebrina pendula* Schnizl. in Bot. Zeit. 7: 870. 1849.**

Type: Cultivated plant known as *Tradescantia zebrina* Hort., no specimen cited.

Prostrate, trailing or pendent plants, with glabrous or pilose stems. Leaf sheaths villous; blades ovate, 3-7 cm. long, 1.5-3.2 cm. broad, the apex acute or acuminate, the base rounded, inequilateral, upper surface silvery-green or -white with portions purple-striped, lower surface reddish-purple. Flowers clustered, subtended by two large, leaflike bracts; calyx lobes oblong-lanceolate to lanceolate, 5 mm. long, 1.5 mm. broad; corolla tube 6

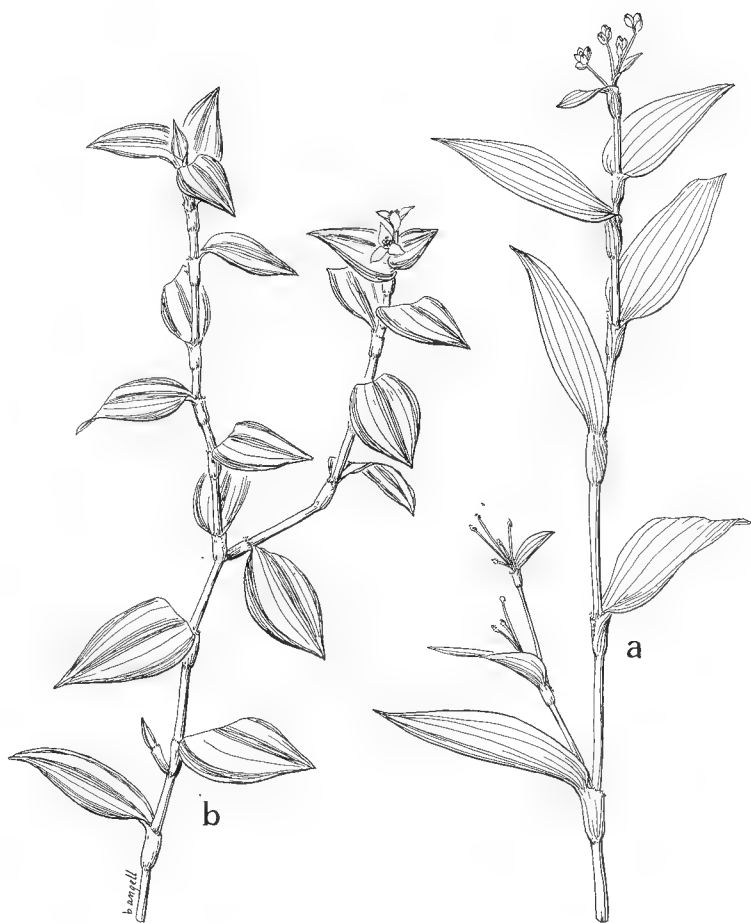


FIGURE 96. Commelinaceae. a, *Tripogandra serrulata*, $\times 0.5$. b, *Zebrina pendula*, $\times 0.5$.

mm. long, lobes ovate, 4.5-5.0 mm. long, 2.7-3.0 mm. broad, rose-purple; ovary glabrous. Capsule and seeds gray-brown.

GENERAL DISTRIBUTION: Mexico, Central America, Greater Antilles, South America.

DISTRIBUTION IN LESSER ANTILLES: Antigua!, Saba!, Montserrat!, Guadeloupe!, Martinique!, St. Lucia!, Barbados!.

COMMON NAMES: Kakalaka, Wandering Jew.

OBSERVATIONS: This species has been cultivated and naturalized in the Lesser Antilles since the time of Grisebach and Duss.

PONTEDERIACEAE

PONTEDERIACEAE Kunth in H.B.K., Nov. Gen. Sp. (folio ed.) 211. 1816.

Annual or perennial floating or rooted herbs of fresh water. Stems short, leaves opposite or pseudovercillate, vaginate. Inflorescence axillary or falsely terminal, spicate, racemose or paniculate, subtended by spathe-like leaf sheath. Flowers perfect, regular or zygomorphic; perianth of 6 imbricated segments, free or basally connate; stamens 6 or 3, inserted on the perianth, often unequal, the filaments free; ovary superior, 3-locular with axile placentation or 1-locular with parietal placentation, with ovules numerous or solitary, the styles slender, the stigma 3- to 6-lobed. Fruit a capsule, 3-valved or indehiscent; seeds generally ribbed.

TYPE GENUS: *Pontederia* L.

A family of seven genera and about 30 species found in tropical waters.

KEY TO THE GENERA

1. Flowers showy, perianth blue or violet; stamens 6; petioles swollen.
..... *Eichhornia*
- 1a. Flowers small, perianth white; stamens 3; petioles not inflated.
..... *Heteranthera*

EICHHORNIA Kunth

Eichhornia Kunth, *Eichhornia*, Genus Novum (Diss.) 1842, nom. cons.

FIGURE 97a.

Floating or rooted herbs. Leaves commonly with inflated petioles and broad blades and sometimes with linear submerged forms. Inflorescence terminal. Flowers in spikes, racemes or panicles; perianth showy, in two series, united below; stamens 6, irregularly adnate to the perianth, 3 included, 3 exserted, the filaments flattened at the base; ovary 3-locular, with numerous ovules. Fruit capsular, included in the withered perianth, rarely maturing in the Lesser Antilles.

TYPE SPECIES: *Pontederia azurea* Sw., correctly known as *Eichhornia azurea* (Sw.) Kunth.

A genus of seven species ranging from southeastern United States to Argentina and the West Indies.

Eichhornia crassipes (Mart.) Solms in DC., Monogr. Phan. 4: 527. 1883.

Basionym: *Pontederia crassipes* Mart., Nov. Gen. 1: 9. 1824.

Type locality: Brazil.

Syn.: *Piaropus crassipes* (Mart.) Raf., Fl. Tell. 2: 81. 1837.

Plants floating or rooted in mud. Leaves in a pseudorosette; petioles inflated or spongy, fusiform but tapering to the blade and to the stem, 5–35 cm. long; blades leathery, ovate, orbicular or reniform, 3.5–16.0 cm. long, 4–14 cm. wide, the apex short-cuspidate, the base acuminate or rounded. Inflorescence 10–35 cm. long. Flowers in loose spikes, showy; perianth tube curved, the segments obovate to oval, 3–4 cm. long, 1.5–2.5 cm. wide, violet, upper lobe longer with area of blue and spot of bright yellow. Mature fruit not encountered in Lesser Antilles.

GENERAL DISTRIBUTION: Southern United States, Mexico, Central America, Greater Antilles, South America; a native of Brazil, cultivated and escaped elsewhere.

DISTRIBUTION IN LESSER ANTILLES: Antigua!, Guadeloupe!, Dominica!, Martinique!, St. Lucia!, St. Vincent!, Barbados!.

COMMON NAMES: Water hyacinth, water violet, jacinthe d'eau, glaïeul bleu.

Eichhornia paniculata (Spreng.) Solms has been cultivated in botanical gardens.

HETERANTHERA Ruiz & Pavon

Heteranthera R. & P., Fl. Peru. Prodr. 9. 1794, nom. cons. FIGURE 97b.

Perennial floating aquatic or rooted plants. Leaves clustered, ascending or floating; petioles terete; blades strap-shaped or broadly ovate. Inflorescence axillary, few-flowered, subtended by a spathe-like bract. Flowers with perianth regular, 6-parted, the outer lobes narrower than the inner; stamens 3, one with longer filament and larger anther; ovary incompletely 3-celled, with numerous ovules. Capsule dehiscent; seeds numerous, striate.

TYPE SPECIES: *Heteranthera reniformis* Ruiz & Pavon.

A tropical and subtropical genus of ten species occurring in America and Africa.

Heteranthera reniformis R. & P., Fl. Peru. 1: 43. 1798.

Lectotype: Ruiz & Pavon, Fl. Peru. 1: pl. 2. 1798.



FIGURE 97. Pontederiaceae. a, *Eichhornia crassipes*, $\times 0.3$. b, *Heteranthera reniformis*, $\times 0.5$.

Plants floating or rooted, rhizomatous. Leaves erect; petioles to 15 cm. long; blades reniform to orbicular, to 5 cm. long and wide. Inflorescence spicate, 2- to 6-flowered, up to 5 cm. long. Flowers with perianth tubular at base, the spreading tepals 4-5 mm. long, lanceolate; stamens unequal. Capsule 8-12 mm. long, almost terete; seeds numerous.

GENERAL DISTRIBUTION: Mexico, Central America, Greater Antilles, South America.

DISTRIBUTION IN LESSER ANTILLES: Antigua, Guadeloupe.

JUNCACEAE

JUNCACEAE A. L. Jussieu, Gen. 43. 1789.

Sedgelike annual or perennial herbs with horizontal or short, erect rhizomes. Leaves basal, linear or filiform, sheathing at the base; blades occasionally lacking. Inflorescences paniculate or corymbose. Flowers perfect, regular; perianth segments 6, in two separate whorls, chaffy or scalelike; stamens 6 or 3; ovary superior, 1-locular or sometimes divided by septae, with few to many ovules, the styles 1 or 3. Fruit a loculicidally dehiscent capsule; seeds sometimes appendaged.

TYPE GENUS: *Juncus* Linnaeus.

The family is comprised of nine genera and about 400 species found in temperate, arctic and tropical climates, generally in cold and damp montane environments.

JUNCUS Linnaeus

Juncus L., Sp. Pl. 1: 325. 1753.

FIGURE 98.

Perennial glabrous herbs. Leaves sheathed with two auricles; blades terete, flattened or wanting. Inflorescence cymose, paniculate or glomerate, terminal or appearing lateral by the extension of a bract. Flowers with perianth chaffy, tepals narrow, usually sharp at apex; stamens 3; ovary 1- or 3-celled. Capsule 3-celled with central placentae or 1-celled with placentation parietal; seeds numerous.

LECTOTYPE SPECIES: *Juncus acutus* L.

A cosmopolitan genus of approximately 300 species.

KEY TO THE SPECIES

1. Tufted herb to 15 cm. tall; leaf blades flat. *J. bufonis*
- 1a. Stout-culmed herbs 60 cm. to over 1 m. tall. 2
2. Leaf blades present, cylindrical, septate; inflorescence terminal, diffuse, the flowers in heads. *J. guadeloupensis*

- 2a. Leaf blades rudimentary or absent; inflorescence appearing lateral through the erect development of a bract which appears as a continuation of the culm.
..... *J. effusus*

***Juncus bufonis* L., Sp. Pl. 1: 328. 1753.**

Type: Not selected.

Annual tufted herb, the stems slender, to 15 cm., simple or branched from the base, the sheaths tapering to flat blades 10 cm. long and 1 mm. wide. Cymes terminal and open. Flowers in aggregates or scattered, almost secund; tepals linear-lanceolate, 4-6 mm. long, subulate-tipped; stamens 3. Capsule 3-4 mm. long, membranaceous, mucronate at apex; seeds ovoid to ellipsoid, 0.3-0.5 mm. long.

GENERAL DISTRIBUTION: Almost cosmopolitan but rare in the tropics.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe; known from a single record, *Stehlé* 669 (P), made at Bains Jaunes of a plant presumed to be a garden weed.

***Juncus effusus* L., Sp. Pl. 1: 326. 1753.**

Type: Not selected.

Stout-stemmed herb to 1 m. tall, the culms soft to firm, finely striate, green. Leaf blades not developed, the basal sheaths chartaceous, erect, mucronate. Cymes many-flowered with forking branches, basal bract erect and appearing as a continuation of the culm, much exceeding the inflorescence. Flowers with tepals lance-attenuate, 2-3 mm. long; stamens 3. Capsule obovoid, 4 mm. long, membranaceous, rounded or emarginate at the apex; seeds ellipsoidal, 0.5 mm. long.

GENERAL DISTRIBUTION: Almost cosmopolitan.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe; known from a single collection, *C. & F. Sastre, J. Fournet & M. Clairon* 2836 (A, P), from Bains Jaunes.

***Juncus guadeloupensis* Buchenau & Urban in Urb., Symb. Antill. 1: 496. 1900.**

Lectotype: *Duss* 3996, Guadeloupe.

Erect herb to 1.5 m. Leaves many, the sheaths membranaceous, broad, auriculate; blades cylindrical, to 30 cm. long, septate. Inflorescence terminal, decompound and exceeding the lower bract. Flowers in heads; tepals linear-subulate, 4.0-4.5 mm. long; stamens 3. Capsule 6-7 mm. long, apiculate; seeds 1.1 mm. long, the apex apiculate.

GENERAL DISTRIBUTION: Known only from the Lesser Antilles.

DISTRIBUTION IN LESSER ANTILLES: Endemic to Guadeloupe!.

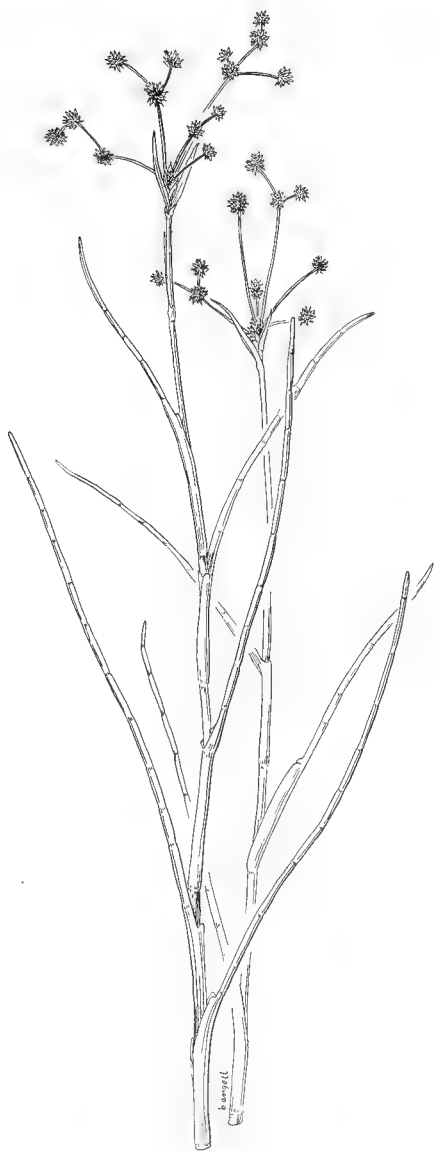


FIGURE 98. Juncaceae. *Juncus guadeloupensis*, $\times 0.3$.

OBSERVATIONS: Recent collections have been made on the upper slopes of the Soufrière volcano on Guadeloupe, dispelling fears that this endemic species might be endangered by the recent eruption. A single unidentified collection (*Duss 4622*(NY)) from Martinique, consisting of young sterile plants and bearing the annotation that it never flowers is referable here. It was made in 1901 at the edge of a lake on Mt. Pelée, a location no longer in existence; the lake and presumably the species were eliminated in the volcanic eruption in 1902.

Several populations found in 1978 on the Soufrière were flowering prolifically, and plantlets had established themselves epiphytically in adjacent shrubs.

LILIACEAE

LILIACEAE A. L. Jussieu, Gen. 48. 1789.

Herbs, with bulbous, rhizomatous or fleshy tuberous roots, the plants occasionally climbing as soft or woody vines. Flowers usually perfect; perianth usually regular, 6-parted or in two cycles; tepals usually similar, petaloid; stamens 6, free or adnate to the perianth tube; ovary superior, usually 3-celled, the placentation axile, the styles usually 1-3, often partially united. Fruit a capsule or berry.

TYPE GENUS: *Lilium* L.

A cosmopolitan family of about 250 genera and 3700 species, the Liliaceae is one of the largest flowering plant families.

KEY TO THE GENERA

1. Plants bulbous; flowers large, white. *Lilium*⁴
- 1a. Plants not bulbous, primarily rhizomatous or with thickened, often tuberous, roots. 2
2. Plants with succulent, often warty leaves, the margins with remote teeth; inflorescence racemose, flowers yellow, pendent. *Aloe*
- 2a. Plants not succulent or fleshy. 3
3. Leaves modified into tendrils at the tip; flowers conspicuous, petals wavy-margined; style abruptly geniculate above the ovary. *Gloriosa*⁴
- 3a. Leaves not attenuated into terminal tendrils. 4
4. Leaf blades broad, narrowed to a petiole; flowers dull brown in color, borne singly from rhizomes at leaf bases just above the surface of the ground. *Aspidistra*⁴
- 4a. Leaf blades linear, not narrowed into a petiole; inflorescence racemose or paniculate, or flowers solitary in the stem axils. 5
5. Leaves reduced to scales, the cladodes axillary, usually clustered, terete or flattened. *Asparagus*
- 5a. Leaves normally developed, without basal scales. 6
6. Inflorescence paniculate; flowers large, the perianth more than 7 cm. long, orange or yellow. *Hemerocallis*

- 6a. Inflorescence racemose; flowers smaller, the perianth parts 1-3 cm. long, white. 7
- 7. Leaves firm, linear, triangular in section; plants not conspicuously stoloniferous. *Asphodelus*⁴
- 7a. Leaves soft and flat; older plants with conspicuous long stolons producing plantlets. *Chlorophytum*⁴

ALOE Linnaeus

Aloe L., Sp. Pl. 1: 319. 1753.

FIGURE 99.

Succulent herb, the caudex short or well developed and woody. Leaves rosulate or distichous, fleshy, margins sharply toothed, with bitter, often acrid sap which turns black on exposure or drying. Inflorescence axillary, racemose or paniculate, scapose near the base. Flowers generally nutant; perianth united, cylindrical, the lobes coherent, the tips spreading or recurved, often brightly colored; stamens 6, the filaments slender, the anthers oblong to linear-oblong; ovary sessile, ovoid to oblong, 3-celled, generally 3-angled, the style filiform, the stigma capitate. Fruit a coriaceous dehiscent capsule; seeds numerous, flattened, black.

LECTOTYPE SPECIES: *Aloe perfoliata* L.

An old world genus; the majority of the approximately 330 species of *Aloe* occur in tropical and South Africa and Madagascar.

Aloe vera (L.) Burm. f., Fl. Ind. 83. 1768.

Basionym: *Aloe perfoliata* var. *vera* L., Sp. Pl. 1: 320. 1753.

Type: Not selected.

Syn.: *Aloe barbadensis* Mill., Gard. Dict. ed. 8. *Aloe* no. 2. 1768; Gooding *et al.*, Fl. Barbados 101. 1965. (Type: Bauhin reference, no specimens cited.)

Aloe vulgaris Lam., Encycl. Méth. Bot. 1: 86. 1783, nom. illeg.; Griseb., Fl. Br. W. Ind. Isl. 582. 1864.

Plants stemless or with short, erect, woody caudex, spreading by stolons. Leaves succulent, mostly in a rosette, narrowly lanceolate, 30-50 cm. long, apex acuminate, margin with remote teeth, blade warty on surface, glaucous-green to brown. Racemes to 1 m. long, scapose at base; flowers closely arranged, perianth yellow or orange, to 2.5 cm. long. Fruit not seen.

GENERAL DISTRIBUTION: Probably native to the Mediterranean region, now widely cultivated and naturalized.

DISTRIBUTION IN LESSER ANTILLES: St. Martin!, St. Barts!, Antigua!, St. Eustatius!, Guadeloupe!, Dominica!, Martinique!, St. Lucia!, St. Vincent!, Barbados.

COMMON NAMES: Aloe, sentebibu, aloës.

OBSERVATIONS: Burman's *Flora Indica* was published shortly before April

⁴ See SPECIES IN CULTIVATION, p. 459.

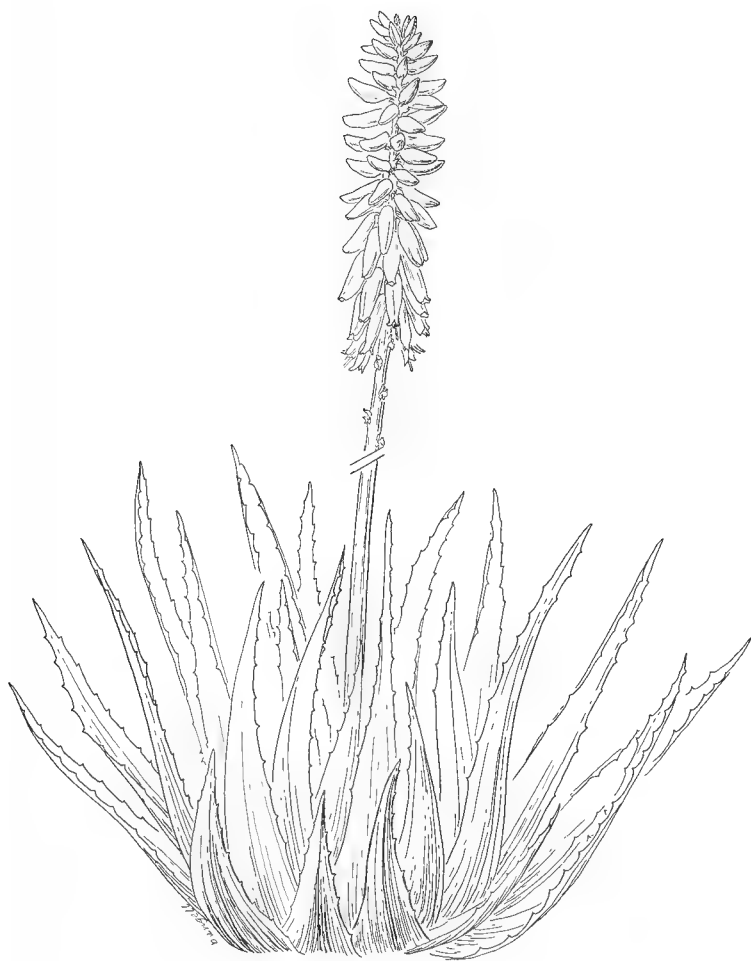


FIGURE 99. Liliaceae. *Aloe vera*, $\times 0.3$.

6, 1768, hence the name *Aloe vera* (L.) Burm. f. has priority over *Aloe barbadensis* Miller, published April 16, 1768.

Fournet (Fl. Guadeloupe Martinique 224, 225. 1978) lists the following species of *Aloe* under cultivation in the French islands: *A. arborescens* Mill., *A. ciliaris* Haw., *A. ferox* Mill., *A. grandidentata* Salm-Dyck., *A. greenii* Baker, and *A. obscura* Mill.

ASPARAGUS Linnaeus

Asparagus L., Sp. Pl. 1: 313. 1753.

Herbaceous, erect or climbing, stiff or slightly woody plants, much branched. Leaves alternate, reduced to dry, often sharp-pointed scales; foliage represented by green, leaflike, flattened or terete and needlelike cladodes. Flowers small, either few to many in racemes or umbels or solitary and pedicellate; perianth campanulate, with 6 segments; stamens 6, attached at the base of the perianth; ovary sessile, 3-celled, each cell with 2 seeds. Fruit a berry.

LECTOTYPE SPECIES: *Asparagus officinalis* L.

An Old World genus of about 300 species generally occurring in dry climates.

KEY TO THE SPECIES

1. Plants erect, dioecious; fruit red. *A. officinalis*
- 1a. Plants climbing or sprawling; flowers perfect. 2
2. Cladodes needlelike, several to many in each fascicle; fruits black.
..... *A. setaceus*
- 2a. Cladodes flat. 3
3. Cladodes nearly straight, to 2.5 cm. long; fruit red. *A. densiflorus*
- 3a. Cladodes curved, 2.5-7.0 cm. long; fruit dull brown. *A. falcatus*

Asparagus densiflorus (Kunth) Jessop in Bothalia 9: 65. 1966.

Basionym: *Asparagopsis densiflorus* Kunth in Abh. Königl. Akad. Wiss. Berlin 1842: 96. 1842; Enum. Pl. 5: 96. 1850.

Type: Cape, South Africa, *Lalande s.n.* (P).

Syn.: *Asparagus sprengeri* Regel in Acta Hort. Petrop. 9: 302. 1890. (Type: Durban, S. Africa; Gartenfl. 1890: 490, f. 80. 1890.)

Stems scrambling or drooping, 1-2 m. long, tough or woody. Cladodes flat, linear or slightly curved, 2.5 cm. long, in clusters of 3-8. Inflorescence racemose, 2-3 cm.; flowers pinkish, aromatic. Berries red.

GENERAL DISTRIBUTION: Native of Africa, cultivated elsewhere.

DISTRIBUTION IN LESSER ANTILLES: St. Martin!, Guadeloupe!, St. Lucia!

COMMON NAME: Sprengeri.

OBSERVATION: Usually cultivated in planters or pots, but persisting on old foundation walls on St. Lucia.

Asparagus falcatus L., Sp. Pl. 1: 313. 1753.

This species is represented by a collection from a cultivated plant (*Duss* 4470 (NY)) made in 1903 in Fort-de-France, Martinique.

Asparagus officinalis L., Sp. Pl. 1: 313. 1753.

Type: Linnaeus, Hortus Cliffortianus 121. 1737.

Herbaceous plants with stems erect, 1–2 m. tall, slightly glaucous, much branched. Scale leaves conspicuous and overlapping on young shoots, scarious and bractlike on old stems; cladodes terete, 1.0–1.3 cm. long, one to several in clusters. Plants dioecious; flowers 1–4, in axillary clusters, pedicels articulated and geniculate, to 12 mm., cream-colored. Berry pendent, red.

GENERAL DISTRIBUTION: Native of Europe, cultivated in temperate and tropical areas.

DISTRIBUTION IN LESSER ANTILLES: St. Martin, Saba!, Guadeloupe!, Grenada!.

COMMON NAMES: Asperge, asparagus.

OBSERVATION: Cultivated for young shoots as the vegetable asparagus, the plants escape or persist in old fields and along stone walls.

Asparagus setaceus (Kunth) Jessop in *Bothalia* 9: 51. 1966.

Basionym: *Asparagopsis setaceus* Kunth in Abh. Königl. Akad. Wiss. Berlin 1842: 35. 1842, Enum. Pl. 5: 82. 1850.

Type: Drege, *Herb. no. 8534* (KIEL).

Syn.: *Asparagus plumosus* Baker in Jour. Linn. Soc. Bot. 14: 613. 1875. (Type: Syntypes cited.)

Tall, climbing, tough or woody vines, much branched, the branches and cladodes close together in frondlike flat sprays. Cladodes many in fascicles, filiform, to 1 cm. long. Flowers axillary, 1–4, on short pedicels, white. Fruit a berry, black.

GENERAL DISTRIBUTION: Native of South America, under cultivation elsewhere.

DISTRIBUTION IN LESSER ANTILLES: St. Martin, St. Eustatius!, St. Kitts!, Guadeloupe, Martinique, St. Lucia!.

COMMON NAMES: Asparagus, mousseline, fern.

OBSERVATION: Although cultivated in gardens or in pots, this plant has become established around old foundations and on stone walls.

HEMEROCALLIS Linnaeus

Hemerocallis L., Sp. Pl. 1: 324. 1753.

Herbs with many fleshy or tuberous roots. Leaves basal, narrow and linear, alternate and subdistichous, keeled. Inflorescences scapose, subpan-

iculate. Flowers with perianth funnelform to campanulate, tubular at the base, flaring uniformly or abruptly above the middle with lobes often recurved; stamens 6, inserted in the throat, the filaments slender, the anthers versatile; ovary oblong, sessile, 3-celled, the style slender, the stigma capitate. Fruit a loculicidal capsule; seeds few.

LECTOTYPE SPECIES: *Hemerocallis lilio-asphodelus* L.

A genus of 20 species native to temperate Eurasia and especially Japan.

KEY TO THE SPECIES

1. Flowers yellow, fragrant, cultivated but not persisting. *H. flava*
- 1a. Flowers orange, without fragrance, cultivated and persisting. *H. fulva*

The spring-flowering *Hemerocallis flava* L., with perianth yellow (Sp. Pl. ed. 2. 462. 1762) and the summer-flowering *Hemerocallis fulva* L., with perianth orange (Sp. Pl. ed. 2. 462. 1762), are both reported as cultivated in the French islands but without specific location or validating specimens (Duss, Fl. Phan. Ant. Fr. 562. 1897, and Fournet, Fl. Guadeloupe Martinique 232. 1978).

SPECIES IN CULTIVATION

Asphodelus albus Miller, Gard. Dict. ed. 8. *Asphodelus* no. 3. 1768.

This native of southern Europe is reported by Fournet (Fl. Guadeloupe Martinique 232. 1978) to be cultivated in the French islands. No specimens have been seen.

Aspidistra lurida Ker-Gawl. in Edw. Bot. Reg. 8: t. 628. 1822.

Fournet (Fl. Guadeloupe Martinique 231. 1978) reported this species to be cultivated in the French islands, however, no specimens have been seen. The correct identification is probably *Aspidistra elatior* Blume.

Chlorophytum elatum (Aiton) R. Br. ex Spreng., Syst. Veg. 2: 88. 1825.

A native of South Africa, this species with long, conspicuous stolons is reported in cultivation in the French islands by Fournet (Fl. Guadeloupe Martinique 232. 1978). No specimens have been seen, and the plant may well be *Chlorophytum capense* (L.) Voss in Siebert & Voss.

Gloriosa L., Sp. Pl. 1: 305. 1753.

Plants of *Gloriosa superba* L. or derived hybrids are represented by herbarium specimens from St. Lucia!, St. Vincent! and Barbados! and reported in cultivation in St. Martin, Saba and St. Eustatius. Fournet (Fl. Guadeloupe Martinique 222. 1978) reports *G. rothschildiana* O'Brien and possibly *G. carsonii* Baker and *G. simplex* L. in cultivation in the French islands.

Lilium L., Sp. Pl. 1: 302. 1753.

Fournet reports the following taxa under cultivation in the French islands: *Lilium longiflorum* Thunb. var. *eximium* Nichols. known as lis-

France or lis de Pâques, and *Lilium candidum* L., the lis de Saint-Joseph or lis de la vierge.

HYPOXIDACEAE

HYPOXIDACEAE R. Brown in Flinders, Voy. Terra Austr. 2: 576. 1814.

Perennial herbs with tuberous rhizomes or corms. Leaves mostly radical, prominently parallel-veined and plicate. Inflorescence capitate or flowers solitary. Flowers perfect, regular, sessile or stalked; perianth tube short but ovary commonly long-beaked, the segments spreading, equal; stamens 6, the anthers longitudinally dehiscent; ovary inferior, 3-locular, with numerous axile ovules, the styles 3. Fruit a capsule or fleshy and berrylike; seeds small, usually black.

TYPE GENUS: *Hypoxis* Linnaeus.

A family of seven genera and about 120 species found in all areas of the world except Europe and northern Asia. See also: R. A. Howard, Nomenclatural notes on some Lesser Antillean Monocotyledoneae, in Jour. Arnold Arb. 60: 290-301. 1979.

KEY TO THE GENERA

1. Ovary extended to form a long beak below the perianth; leaves plaited; fruit berrylike. *Curculigo*
- 1a. Ovary not beaked; leaves flat, not plaited; fruit a capsule. *Hypoxis*

CURCULIGO Gaertner

Curculigo Gaertner, Fruct. & Sem. 1: 63. 1788.

FIGURE 100a.

Plants with short, cylindrical or cormlike rhizomes, the stems and leaves covered with fibers. Leaves few, plicate-veined, elongate, linear. Flowers borne among leaves, short-pedicelled, villose; perianth 6-parted, borne on tubelike extension of ovary, perianth segments unequal; stamens 6, the anthers linear; ovary 3-celled, with 2-many ovules per cell, the style short, with 3 stigmas. Fruit slightly fleshy; seeds subglobose, black.

TYPE SPECIES: *Curculigo orchiodides* Gaertner.

A tropical genus of ten species.

KEY TO THE SPECIES

1. Flowers 1-4; leaves linear, to 30 cm. long, 1.5 cm. wide. ... *C. scorzonierifolia*
- 1a. Flowers numerous, capitate; leaves elliptic-lanceolate, to 1.8 m. long, 6-10 cm. wide. *C. capitulata*

Curculigo capitulata (Lour.) Ktze., Rev. Gen. Pl. 2: 703. 1891; Merrill in Trans. Am. Philos. Soc. 24: 112. 1935.



FIGURE 100. Hypoxidaceae. a, *Curculigo scorzonerifolia*, $\times 0.5$; b, *Hypoxis decumbens*, $\times 0.5$.

Basionym: *Leucoium capitulatum* Lour., Fl. Cochinch. I: 199. 1790.

Type: "Habitat inculta, non frequens, in Cochinchina."

Syn.: *Curculigo recurvata* Dryander in Aiton, Hort. Kew. ed. 2. 2: 253. 1811. (Type: "Nat. of the Eastern frontier of Bengal. Introd. 1805, by William Roxburgh" [Chittagong, Dr. F. Buchanan, 1798: Hort. Beng. 1814].)

Plants commonly forming dense clumps; underground stem fleshy, erect, cylindrical. Leaves elliptic-lanceolate, narrowed at both ends, up to 1.8 m. long, 6–10 cm. wide. Inflorescence capitate, erect, becoming curved or recurved in fruit; peduncles short to elongate, pubescent; bracts narrowly lanceolate; flowers with yellow perianth. Fruit fleshy, black.

GENERAL DISTRIBUTION: Native of the East Indies, cultivated and naturalized in tropical countries.

DISTRIBUTION IN LESSER ANTILLES: Saba!, Martinique!, Grenada!.

COMMON NAME: Mountain cabbage.

***Curculigo scorzoneraefolia* (Lam.) Baker in Jour. Linn. Soc. Bot. 17: 124. 1878.**

Basionym: *Hypoxis scorzoneraefolia* Lam., Encycl. Méth. Bot. 3: 183. 1789; Griseb., Fl. Br. W. Ind. Isl. 585. 1864.

LECTOTYPE: Plumier, Pl. Amer. t. 108, f. 2. Locality not designated by Plumier, but said by Lamarck to be St. Vincent or Santo Domingo.

Underground stem fleshy, erect, cylindrical. Leaves few, linear; blades 10–30 cm. long, 0.5–1.5 cm. wide, pilose, gradually or abruptly narrowed at the base. Flowers borne singly on short axillary peduncles; perianth tube 2 cm. long, pilose, the lobes bright yellow inside, 1.1–1.2 cm. long.

GENERAL DISTRIBUTION: Mexico, Central America, Greater Antilles, Trinidad, South America.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe!, Dominica!, Martinique!, St. Vincent!.

HYPOXIS Linnaeus

Hypoxis L., Syst. Nat. ed. 10. 986. 1759.

FIGURE 100b.

Herbs with corms. Leaves linear, grasslike. Scapes slender, 1- to few-flowered; perianth 6-parted, the segments free, withering and persistent; stamens inserted on perianth, the filaments short, the anthers erect; ovary 3-celled, not extended or narrowed at apex, with ovules numerous, the style short, the stigmas 3. Capsule thin-walled, elongate, circumscissile below the apex; seeds subglobose, tuberculate, black.

LECTOTYPE SPECIES: *Hypoxis erectum* L., nom. illeg., correctly known as *Hypoxis hirsuta* (L.) Coville.

This genus, comprised of about 100 species, occurs in the Americas, Africa, and Eastern Asia through the Malay Peninsula to Australia.

Hypoxis decumbens L., Syst. Nat. ed. 10. 986. 1759; Pl. Jam. Pugillus 396. 1759.

Lectotype: LINN 427.2 (Miller, Cat. Pl. pl. 39, f. 2. 1730).

Syn.: *Hypoxis procumbens* auct., sphalm.; Duss, Fl. Phan. Ant. Fr. 562. 1897.

Corms 1-2 cm. thick, the underground stems upright. Leaves linear, 1 cm. broad, and up to 40 cm. long but usually much shorter. Peduncles axillary, to 20 cm. long in fruit, 1-4-flowered; outer perianth greenish, inner perianth segments yellow, 4-9 mm. long. Capsule 1-2 cm. long, tipped with the persistent, withered perianth.

GENERAL DISTRIBUTION: Mexico, Central America, Greater Antilles, South America.

DISTRIBUTION IN LESSER ANTILLES: Antigua!, Saba, St. Kitts!, Guadeloupe!, Dominica!, Martinique!, St. Lucia!, St. Vincent!, Grenada!.

COMMON NAMES: Petit safran, Star of Bethlehem.

SMILACACEAE

SMILACACEAE Ventenat, Tabl. Regne Vég. 2: 146. 1799.

Woody or herbaceous vines; stems prickly or unarmed on old and/or young growth. Plants dioecious. Leaves alternate, petiolate, the petiole articulated above a pair of branched tendrils, the blade coriaceous or membranaceous, with veins arcuate-ascending from the base, the ultimate venation densely reticulate on both surfaces when dry, margin entire or spiny, midrib often prickly on abaxial surface; younger growth often with much smaller leaves. Inflorescence pedunculate, umbellate. Flowers with perianth segments 6; stamens 6, free, the anthers basifixed, pistillate rudiment lacking in staminate flowers; staminodes present or absent in pistillate flowers, the ovary 3-celled, with 1 or 2 ovules in each cell, the styles wanting, the stigmas 3, elongate and recurved. Fruit a fleshy berry, orange, yellow or black; seeds 1-6.

TYPE GENUS: *Smilax* L.

A tropical and temperate family of four genera and about 375 species.

SMILAX Linnaeus

Smilax L., Sp. Pl. 2: 1028. 1753.

FIGURE 101.

Characters of the family.

LECTOTYPE SPECIES: *Smilax aspera* L.

A genus of about 350 tropical and subtropical species. For more information, see O. E. Schulz, *Smilax* Linn., in Urban, Symb. Antill. 5: 17-47 1904, and R. A. Howard, The Genus *Smilax* L. in the Lesser Antilles, in Taxon 28 (1, 2/3): 55-58. 1979.

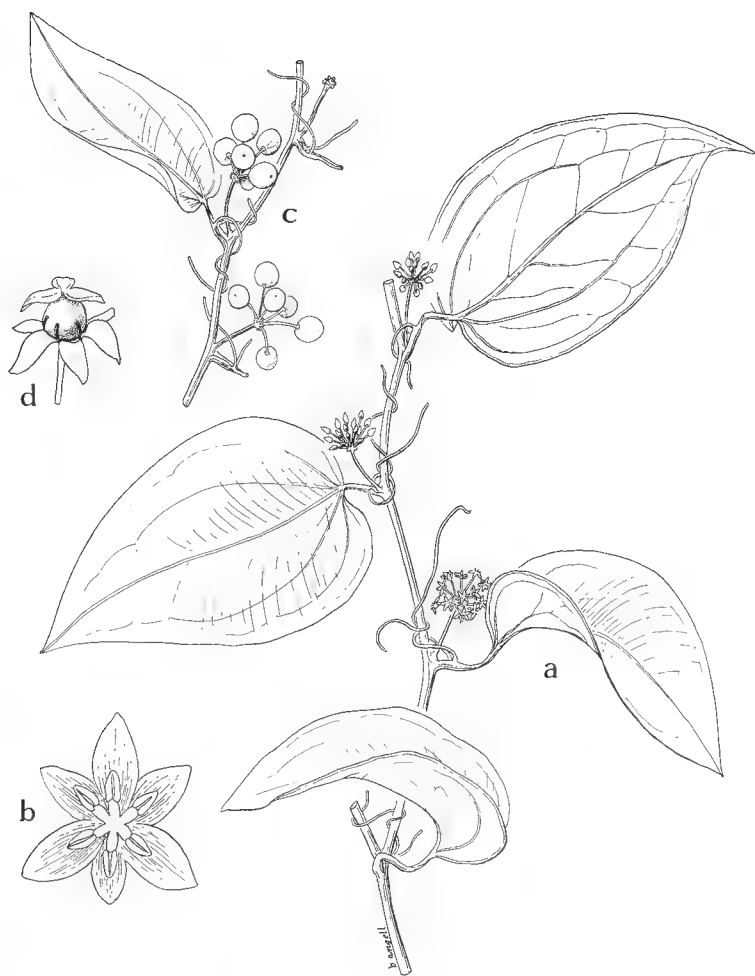


FIGURE 101. Smilacaceae. a-d, *Smilax guianensis*: a, habit of staminate plant, $\times 0.5$; b, staminate flower, $\times 5$; c, habit of pistillate plant in fruit, $\times 0.3$; d, pistillate flower with staminodia, $\times 5$.

KEY TO THE SPECIES

1. Stems and leaves of young shoots without spines or prickles. . . . *S. guianensis*
- 1a. Stems and/or leaves of young shoots with prickles. 2
2. Leaves oblong-ovate to ovate-lanceolate, margins spinose; prickles slender and terete. *S. coriacea*
- 2a. Leaves oval to broadly cordate, margins entire; prickles narrowly triangular and flattened. *S. oblongata*

Smilax coriacea Spreng., Syst. Veg. 2: 103. 1825.

Type: Hispaniola, authentic specimen unknown.

Syn.: *Smilax ilicifolia* sensu Boldingh, Fl. Dutch W. Ind. Isl. 37. 1909.

Woody vine with long and scandent or trailing stems; stem prickles slender, terete, often dense. Leaves with petioles 15–24 mm. long; blades oblong-ovate to ovate, 10–19 cm. long, 4–11 cm. wide, apex acute and apiculate to shortly attenuate, base cordate to rounded, margin usually with irregular distribution of prickles, midrib occasionally with minute prickles. Inflorescence axillary, peduncles 1–3 mm. long. Staminate flowers with peduncles 4–6 mm. long, with perianth parts 2–3 mm. long; pistillate flowers on peduncles 2–3 mm. long, with perianth parts 1.5–1.8 mm. long. Berry globose, 4–5 mm. in diameter, black.

GENERAL DISTRIBUTION: Hispaniola, Puerto Rico, Virgin Islands.

DISTRIBUTION IN LESSER ANTILLES: St. Martin!, Antigua, Saba, St. Eustatius, Guadeloupe, Martinique.

COMMON NAMES: Liane-bamboche, boyau-chat, liane-noyau, salsepareille bâtarde.

Smilax guianensis Vitman, Summa. Plant. 5: 422. 1791.

Type: Martinique, Plumier, Pl. Amer. t. 84. 1756.

Syn.: *Smilax megalophylla* Duhamel, Trait. Arb. ed. 2. 1: 244. 1801. (Type: *Herb. Jussieu*.)

Smilax macrophylla Willd., Sp. Pl. ed. 4. 2: 786. 1806; Griseb., Fl. Br. W. Ind. Isl. 586. 1864; Duss, Fl. Phan. Ant. Fr. 563. 1897. (Type: Plumier, Pl. Amer. t. 84.)

Smilax solanifolia DC., Monogr. Phan. 1: 161. 1878. (Type: St. Vincent, *Anderson* (K).)

Unarmed, woody, glabrous vines. Mature lower leaves with petioles 1.5–2.0 cm. long; blades ovate, rarely oblong-lanceolate, 21–29 cm. long, 20–23 cm. wide, apex acuminate or acute, base deeply cordate to rounded, 5–7-veined, margins entire, often undulate; upper and immature leaves generally smaller, ovate-lanceolate to narrowly lanceolate, 10–14 cm. long, 4.5–5.5 cm. wide. Peduncles 1.5–2.0 cm. long; flowering pedicels 1.0–2.5 cm. long; perianth reddish, the segments 3–5 mm. long in staminate flowers, shorter in pistillate. Berry to 1 cm. in diameter, orange-yellow, apparently becoming black, usually 1 or 2-seeded.

GENERAL DISTRIBUTION: Endemic to the Lesser Antilles.

DISTRIBUTION IN LESSER ANTILLES: Antigua!, Saba!, St. Eustatius!, Guadeloupe!, Dominica!, Martinique!, St. Lucia!, St. Vincent!.

COMMON NAMES: Boyau-chat, liane-boyau, boyeau diable, whist, basket vine.

OBSERVATION: Personal field observations as well as other collectors' notes indicate that this is an unarmed species. However, two collections, *Duss 1047* and *3311* (both NY), from Martinique have stout stem fragments densely armed with short, flattened, retrorse, woody prickles; these are mentioned in Duss's description (Fl. Phan. Ant. Fr. 563. 1897).

***Smilax oblongata* Sw., Prodr. 59. 1788, Fl. Ind. Occ. 1: 637. 1797.**

Type: St. Vincent.

Syn.: *Smilax cumanensis* sensu Schulz in Urban, Symb. Antill. 5: 34. 1904, in part.

Smilax cumanensis var. *infesta* Schulz in Urban, Symb. Antill. 5: 36. 1904. (Type: Grenada, *Broadway 1132*).

Woody vine; stems and midribs of leaves sparsely armed with triangular, flattened, recurved prickles. Leaves with petioles 10–12 mm. long; blades oval to broadly cordate, 7–15 cm. long, 5–10 cm. wide, apex acuminate or acute and apically minutely mucronate, base cordate, truncate or rounded, occasionally asymmetrical, primary veins 5, the outer pair submarginal, margins entire, texture papery to leathery when dry. Peduncles 6–12 mm. long, pedicels 5–8 mm. long; perianth segments 2.3 mm. long in staminate flowers, shorter in pistillate flowers. Berries 5 mm. in diameter, black.

GENERAL DISTRIBUTION: Restricted to the Lesser Antilles.

DISTRIBUTION IN LESSER ANTILLES: St. Lucia!, St. Vincent!, the Grenadines!, Grenada!, Barbados!.

OBSERVATIONS: In his *Prodromus*, Swartz indicated this species to be from "India occidentalis"; in *Flora Indiae Occidentalis* he stated, "Insularum Caribaeorum: St. Vincentii." A Swartz specimen in Stockholm labeled "India occid.," but not in Swartz's handwriting. In 1909, E. G. Baker of the British Museum supplied N. L. Britton with a tracing of an Anderson specimen from St. Vincent with the comment "which I take to be a type of the species" of *S. oblongata* Sw. The choice of a lectotype would require an examination of both specimens.

Schulz incorrectly applied the name *S. oblongata* Sw. to material from the Bahamas and Hispaniola, noting in addition "St. Vincent ex Sw." Also, he included the Lesser Antillean material considered here under the name *Smilax cumanensis* Willd. (Sp. Pl. 4: 783. 1806; type: Humboldt, Herb. Willd. IDC 7440. 1338. II. 1.) and described it as having unarmed stems. I believe *S. cumanensis* applies only to material from northern South America, Trinidad and Tobago.

SPECIES IN CULTIVATION

Smilax mollis Willd., a report by Schulz (in Urban, Symb. Antill. 5: 21. 1904) based on an Anderson collection from St. Vincent (κ), was probably cultivated at one time in the botanical garden.

DOUBTFUL SPECIES

Smilax walteri Pursh, cited by Schulz (in Urban, Symb. Antill. 5: 25. 1904) on the basis of *Duss 1047c (mas flor)* from Martinique, may have been in the Berlin Herbarium but is no longer available. Duss (Fl. Phan. Ant. Fr. 563. 1897) reported his collections 1047 and 1047b as coming from four locations.

Smilax rotundifolia L. was reported from Martinique by Stehlé (in Bull. Soc. Bot. France 123: 445. 1976). No specimen has been seen, and Fournet (Fl. Guadeloupe Martinique 220. 1978) was unable to verify this record or that of *S. walteri*.

HAEMODORACEAE

HAEMODORACEAE R. Brown, Prodr. 299. 1810.

Perennial herbs, tuberous or rhizomatous, with erect stems. Leaves basal, distichous and sheathing on upright stems, narrowly to broadly linear, often hairy. Inflorescence terminal, cymose, racemose or paniculate. Flowers regular, perfect; perianth either 6-parted and the parts separate or 6-lobed above and tubular below, persistent; stamens 6 or 3, the filaments free; ovary inferior or superior, 3-celled, with few or many ovules, the styles slender, the stigmas small. Capsule loculicidally 3-valved; seeds few to many.

TYPE GENUS: *Haemodorum* J. E. Smith.

A family of 75 species in 14 genera, distributed in South Africa, Australia, and North and tropical America. See also: R. A. Howard, Nomenclatural notes on some Lesser Antillean Monocotyledoneae, in Jour. Arnold Arb. 60: 290-301. 1979.

XIPHIDIUM Aublet

Xiphidium Aubl., Pl. Guian. 1: 33. 1775.

FIGURE 102.

Stout, stoloniferous herbs with creeping rhizomes and erect stems. Leaves distichous, equitant, sheathed at the base. Inflorescence terminal, paniculate. Flowers secund on branches, in two rows; perianth 6-parted, the lobes spreading; stamens 3, the filaments short, the anthers oblong; ovary superior, 3-celled, with numerous ovules, the styles filiform, the stigmas apical. Capsule subglobose, loculicidally valvate; seeds numerous.

TYPE SPECIES: *Xiphidium caeruleum* Aubl.



FIGURE 102. Haemodoraceae. a, b, *Xiphidium caeruleum*: a, habit, $\times 0.3$; b, portion of fruiting branch, $\times 0.3$.

A genus of one or two species native to tropical America and the West Indies.

Xiphidium caeruleum Aubl., Pl. Guian. 1: 33. t. 11. 1775.

Type: Guiana, Aubl., Pl. Guian. t. 11.

Syn.: *Xiphidium floribundum* Sw., Prodr. 17. 1788; Griseb., Fl. Br. W. Ind. Isl. 589. 1864. (Type: Not indicated.)

Xiphidium albidum Lam., Illus. 1: 131. 1791. (Type: Martinique, *Loefling*.)

Erect stems 20–60 cm., occasionally to 1 m. tall. Leaves linear-lanceolate, glabrous, 35–60 cm. long, 3–6 cm. wide, long-acuminate at the apex. Panicle to 30 cm. long, the axis pubescent; pedicels 2–5 mm. long; perianth segments oblong-lanceolate, to 6.5 mm. long, white. Small deciduous plantlets occasionally produced in axils of bracts in the inflorescence. Capsule 5–6 mm. in diameter.

GENERAL DISTRIBUTION: Mexico, Central America, Greater Antilles, Trinidad, South America.

DISTRIBUTION IN LESSER ANTILLES: St. Kitts!, Montserrat!, Dominica!, St. Vincent!.

AMARYLLIDACEAE

AMARYLLIDACEAE J. St. Hilaire, Expos. Fam. 1: 134. 1805.

Perennial herbs from tunicated bulbs. Leaves generally few, basal, entire, soft or fleshy. Inflorescence scapose, the scapes solid or hollow. Flowers pedicellate or sessile, solitary or umbellate, subtended by one or more membranaceous spathaceous bracts; perianth commonly petaloid, of 6 segments in two similar or slightly dissimilar series, often united below into a short or long tube, occasionally bilaterally zygomorphic and declinate; stamens 6, hypogynous or epipetalous, the filaments free or connate into a basal membranous cup or with flanges, the free portion short or very long, often declinate, the anthers mostly versatile; ovary inferior, 3-locular, commonly strongly 3-lobed with few to many ovules, the style slender, the stigma lobed or capitate. Fruit a fleshy or dry capsule or a berry; seeds numerous to few, varying in size, spherical or flattened and stacked.

TYPE GENUS: *Amaryllis* Linnaeus.

Usually found in tropical or subtropical areas, the family consists of 85 genera and about 1100 species. See also R. A. Howard, Nomenclatural notes on some Lesser Antillean Monocotyledoneae, in Jour. Arnold Arb. 60: 290–301. 1979.

KEY TO THE GENERA

- 1. Corona present within the flower. 2
- 1a. Corona wanting. 5

2. Corona of small fimbriate scales on the tepals, independent of the staminal filaments; tepals red or orange; scape hollow. *Hippeastrum*
- 2a. Corona formed of expanded bases of filaments; perianth white; scape solid. . . 3
3. Filaments elongate and slender; perianth segments linear; leaves linear-oblong to elliptic-lanceolate. *Hymenocallis*
- 3a. Filaments short, about equaling the anthers; perianth segments ovate; leaves broader and petiolate. 4
4. Corona toothed; leaf blade broader than long, cordate at the base; cultivated. *Eurycles amboinensis* (L.) Lindl.⁵
- 4a. Corona notched but not toothed; lamina longer than broad, tapered or rounded to a petiole. *Eucharis*
5. Flowers small, red, 50 or more in globose umbel; fruit a red or black berry; often flowering without leaves present; cultivated. *Haemanthus multiflorus* Martyn⁵
- 5a. Flowers large and showy, 1 to several or as many as 50, but then not red. 6
6. Flowers solitary; bulbs 3 cm. in diameter; perianth tube short, capsule lobes spreading at dehiscence; seeds flat, black. *Zephyranthes*
- 6a. Flowers in umbels; bulbs more than 3 cm. in diameter; capsule opening irregularly or disintegrating; perianth tube slender, elongate; seeds few, large, fleshy, green. *Crinum*

CRINUM Linnaeus

Crinum L., Sp. Pl. 1: 291. 1753.

FIGURE 103.

Tunicated bulbs occurring singly or in masses, the neck short and thin or thick and extended as leaf bases. Leaves linear or strap-shaped, spreading or arching, succulent, rough-margined. Scape solid, green or brightly colored; spathe bracts 2, generally membranaceous, often colored, individual flowers subtended by narrower bracts. Flowers umbellate, stalked or sessile; perianth funnellform or salverform, the tube straight or curved, the segments linear or lanceolate-oblong, subequal; stamens inserted on the throat, spreading or declinate, the filaments filiform, glabrous, the anthers linear, versatile; ovary 3-celled, usually with 2 ovules in each cell, the style slender, the stigma capitate. Fruit subglobose, membranaceous or coriaceous, irregularly dehiscent; seeds few, large, green.

LECTOTYPE SPECIES: *Crinum americanum* L.

A genus of about 100 species occurring in tropical and subtropical countries throughout the world. Many species are cultivated for their large, showy flowers. See also L. S. Hannibal, Garden Crinums, in Bull. Louisiana Soc. Hort. Res. 3(5): 219-322. 1972.

KEY TO NATURALIZED SPECIES

1. Perianth funnellform, the tube curved; flowers drooping, segments broad. . . 2
- 1a. Perianth salverform, the segments linear, spreading or arching; flowers mostly erect. 3

⁵ See SPECIES IN CULTIVATION, p. 473.

2. Pedicels 2.5-4.0 cm. long; spathes brown or stramineous; scape green; segments white flushed with pink. *C. bulbispermum*
- 2a. Flowers subsessile; scape and spathes purple; segments white with purple keel. *C. latifolium* var. *zeylanicum*
3. Flowers mostly 30-50, white, tube green. *C. asiaticum*
- 3a. Flowers mostly 10-20, primarily red or pink. 4
4. Perianth segments half as long as tube, reflexed, rose or red. .. *C. erubescens*
- 4a. Perianth segments as long as the tube, spreading, purplish. *C. amabile*

Crinum amabile Ker-Gawl. in Curtis Bot. Mag. 39: t. 1605. 1814 [Donn., Hort. Cantab. ed. 6. 83. 1811, nomen].

Lectotype: Curtis Bot. Mag. 39: t. 1605.

Bulb forming a sheathed column 13 cm. in diameter and 50 cm. high. Leaves 25-30, strap-shaped, tapering to apex, 1.3-1.7 m. long, 15 cm. wide, the margins entire, the apex blunt. Scape compressed, 1.2 m. long; bracts 10-13 cm. long. Inflorescence an umbel of 10-30 flowers. Flowers pedicellate, the pedicels 1-3 cm. long; buds nodding, crimson; perianth tube erect, purple-red, 10-13 cm. long, the segments 10-13 cm. long, 1 cm. wide, spreading, deep rose-red outside, pale pink inside; style declinate, red, shorter than tepals. Fruit not described.

GENERAL DISTRIBUTION: Native of India, cultivated in tropical countries.

DISTRIBUTION IN LESSER ANTILLES: St. Martin, Saba, St. Eustatius, Guadeloupe!, Martinique!, St. Vincent!.

COMMON NAMES: Grand lis rouge, gros lis rouge.

Crinum asiaticum L., Sp. Pl. 1: 292. 1753.

Type: Probably a Hermann specimen.

Bulb and column 12 cm. in diameter, 20-30 cm. long. Leaves linear-lanceolate, 20-30 per bulb, 1.2-1.7 m. long, 10-13 cm. wide, narrowing gradually at apex, the margins entire. Scape shorter than leaves, compressed; spathe bracts 8-10 cm. long. Inflorescence umbellate, 30-50-flowered. Flowers with pedicels 1.0-2.5 cm. long; perianth tube 10 cm. long; tepals 9 cm. long, spreading. Fruit globose, 2-4 cm. in diameter.

GENERAL DISTRIBUTION: Native of India, cultivated in tropical countries.

DISTRIBUTION IN LESSER ANTILLES: St. Lucia!.

Crinum bulbispermum (Burm.) Milne-Redhead & Schweickerdt in Jour. Linn. Soc. Bot. 52: 161. 1939.

Basionym: *Amaryllis bulbispermum* Burman, Fl. Cap. Prodr. 9. 1768.

Type: From South Africa, represented by Curtis Bot. Mag. 18: t. 661. 1803.

Syn.: *Crinum longifolium* auct., non Thunb.

Herbs commonly forming dense clumps; bulbs 7-10 cm. in diameter, chestnut brown, narrowed into a long neck. Leaves several, ensiform, to 1



FIGURE 103. Amaryllidaceae. *Crinum bulbispermum*, habit base, $\times 0.1$, the inflorescence, $\times 0.3$.

m. long, 4-8 cm. wide, usually broken, the apex acute, the base tapered. Scape to 70 cm. long, green; spathe bracts straw-colored. Inflorescence umbellate, 8-12-flowered. Flowers with pedicels 3-5 cm.; perianth funnel-form, tube greenish, curved; tepals lanceolate-oblong, 2-3 cm. wide, recurving at apex, white or rose-tinted outside; stamens equal to perianth, declinate. Fruit not seen.

GENERAL DISTRIBUTION: Native of South Africa, cultivated in tropical countries.

DISTRIBUTION IN LESSER ANTILLES: Antigua!, St. Kitts!, Guadeloupe!, Martinique!.

Crinum erubescens L. f. ex Aiton, Hort. Kew. 1: 413. 1789.

Type: Cultivated plant represented by Curtis Bot. Mag. 27: t. 1073. 1807.

Bulbs 7-10 cm. in diameter, the neck short. Leaves numerous, linear-lorate, 60-100 cm. long, 4-7 cm. wide, the apex obtuse. Scape 60 cm. long, often red or rose; spathe bracts lanceolate, 10 cm. long. Inflorescence umbellate, flowers 4-12, subsessile, perianth tube erect, 12-15 cm. long; tepals half the length of tube, reflexed, red or rose outside; filaments bright red. Fruit not described.

GENERAL DISTRIBUTION: Native of Central America, cultivated in tropical countries.

DISTRIBUTION IN LESSER ANTILLES: St. Kitts!, Guadeloupe!.

Crinum latifolium L., Sp. Pl. 1: 291. 1753, var. **zeylanicum** (L.) Hook. f. in Trimen, Handb. Fl. Ceylon 4: 272. 1898.

Basionym: *Amaryllis zeylanicum* L., Sp. Pl. 1: 293. 1753.

Type: Not indicated.

Syn.: *Crinum zeylanicum* L., Syst. ed. 12. 2: 236. 1770; Fournet, Fl. Guadeloupe Martinique 236. 1978.

Herb forming an elongate bulb to 25 cm. in diameter, with neck to 60 cm. high. Leaves numerous, strap-shaped, to 90 cm. long, 5-8 cm. wide, the apex rounded. Scape to 60 cm. long, usually purple; spathe bracts purple, scarious. Flowers in umbels, 5-7, subsessile; tube curved, the limb funnelform; tepals white with purple keel, to 10 cm. long, 2.5 cm. wide; stamens declinate, shorter than tepals. Fruit not described.

GENERAL DISTRIBUTION: Native of Ceylon and India, cultivated in tropical countries.

DISTRIBUTION IN LESSER ANTILLES: Saba!, Guadeloupe, Martinique!.

SPECIES IN CULTIVATION

The following species have been or are currently under cultivation in the Lesser Antilles. No supporting herbarium material has been seen; the names and associated islands are taken from literature reports.

Crinum americanum L. subsp. *robustum* L. S. Hannibal—Martinique.
Crinum graciliflorum Kunth & Bouché—St. Martin, St. Eustatius, Saba.
Crinum jagus (Thompson) Dandy—Barbados.
Crinum loddigesianum Herbert—Guadeloupe.
Crinum submersum Herbert—Saba.

EUCHARIS Planchon & Linden

Eucharis Planchon & Linden, Fl. Serres 8: 107. 1852-1853. FIGURE 104.

Bulbs tunicated. Leaves several, the blades broad, abruptly narrowed into slender petioles. Inflorescence scapose, bracteate below the umbellate flowers. Flowers pedicellate; perianth tube cylindric, somewhat curved, dilated above, the segments equal, spreading, ovate or oblong; stamens inserted at the throat, the filaments appendaged below the middle, the anthers versatile; ovary globose, 3-celled, with many superposed ovules in each cell, the style filiform, the stigma capitate, 3-lobed. Capsule lobed, dehiscent; seeds large.

TYPE SPECIES: *Eucharis candida* Planchon & Linden.

A tropical South American genus of ten species.

Eucharis grandiflora Planchon & Linden, Fl. Serres 9: 255. 1853-1854.

Type: Cultivated plant from Colombia represented by Fl. Serres pl. 957.

Bulbs globose, to 7 cm. in diameter. Leaves with petioles 15-30 cm. long; blades oblong to elliptic or oval, 25-35 cm. long, 10-15 cm. wide, the base cuneate or rounded, the apex abruptly short-acuminate. Scape to 50 cm. tall. Inflorescence umbellate, 4-6-flowered. Pedicels 1.0-2.5 cm. long; perianth tube 5 cm. long, the segments oblong-ovate, 3-5 cm. long, white, with apex apiculate; filament flanges connate, free portion lanceolate. Capsule 2.5 cm. in diameter.

GENERAL DISTRIBUTION: Native of Colombia found in cultivation in many tropical countries. In the Lesser Antilles, this species is cultivated and also persists.

DISTRIBUTION IN LESSER ANTILLES: St. Martin, Saba, St. Eustatius, Nevis!, Guadeloupe!, Dominica!, Martinique!, Barbados!.

Eucharis sanderii Baker (in Curtis Bot. Mag. 109: t. 6676. 1883) was reported in cultivation on Saba.

HIPPEASTRUM Herbert

Hippeastrum Herb. in Edw. Bot. Reg. 7(App.): 31. 1821, nom. cons.

FIGURE 105.

Tunicated, bulbous herbs. Leaves basal, linear or strap-shaped. Inflorescence umbellate on stout hollow scape; spathe bracts lanceolate, membranaceous. Flowers few or several, stalked, declinate; perianth tube short



FIGURE 104. Amaryllidaceae. a, b, *Eucharis grandiflora*: a, leaf, $\times 0.5$; b, portion of inflorescence, $\times 0.5$.

or long, with scales or corona in throat, the segments spreading, nearly equal; stamens 6, inserted on throat, the filaments filiform, the anthers linear, versatile; ovary 3-celled, with many, superposed ovules in each cell, the style long, declinate, the stigma capitate or trifid. Capsule globose, loculicidally dehiscent; seeds flattened, black.

TYPE SPECIES: *Hippeastrum reginae* (L.) Herbert, based on *Amaryllis reginae* L., typ. cons.

An American genus with 75 species occurring in tropical and subtropical climates.

***Hippeastrum puniceum* (Lam.) Ktze., Rev. Gen. Pl. 2: 703. 1891.**

Basionym: *Amaryllis punicea* Lam., Encycl. Méth. Bot. 1: 122. 1783.

Type: Merian, Metamorph. Insect. Surinam t. 22. 1705.

Syn.: *Amaryllis equestris* Ait., Hort. Kew. 1: 417. 1789. (Type: Described from a cultivated plant.)

Hippeastrum equestre (Ait.) Herbert in Edw. Bot. Reg. 7(App.): 31. 1821.

Hippeastrum puniceum var. *mariae-galantae* Stehlé in Bull. Soc. Bot. France 123: 446. 1976, nom. illeg.

Bulbose herb; bulbs globose or globose-ovoid, 4-5 cm. long; plants commonly stoloniferous. Leaves strap-shaped or oblong-lanceolate, 28-65 cm. long, 3-5 cm. wide, narrowed to a blunt apex. Scape 40-60 cm. long, terete, glaucous; spathe bracts lanceolate, to 7 cm. long. Inflorescence a 2-4-flowered umbel. Flowers declinate; pedicels 3.5-7.0 cm. long; perianth tube to 3.5 cm. long, green; tepals to 9 cm. long, spreading, elliptic-obovate or obovate, bright red, red-orange and with a greenish base. Capsule rare, to 2 cm. in diameter.

GENERAL DISTRIBUTION: Central America, Greater Antilles, northern South America. In the Lesser Antilles this species is cultivated or established.

DISTRIBUTION IN LESSER ANTILLES: St. Martin, Antigua!, Saba!, St. Eustatius!, Guadeloupe!, La Desirade!, Dominica!, Martinique!, St. Lucia!, St. Vincent!, the Grenadines!, Grenada!.

COMMON NAMES: Easter lily, red lily, leli, grote pinpin, lis rouge, fleur-trompette.

SPECIES IN CULTIVATION

Hippeastrum reginae (L.) Herb., characterized by a bright red perianth with a greenish-white star in the throat, and *Hippeastrum vittatum* (L'Her.) Herb., with the tepals striped red between white midrib and margins, have been reported in cultivation. A double-flowered form, *Hippeastrum puniceum* cv. Semiplenum, was seen on St. Lucia. A specimen labeled "*Crinum giganteum*" Duss (Fl. Phan. Ant. Fr. 560. 1897) (Duss 2142 (NY!)) is a cultivar of *Hippeastrum*, according to Hannibal.



FIGURE 105. Amaryllidaceae. *Hippeastrum puniceum*, $\times 0.3$.

HYMENOCALLIS Salisbury

Hymenocallis Salisb. in Trans. Hort. Soc. London 1: 338. 1812.

FIGURE 106.

Tunicated, bulbous plants. Leaves sessile or petioled, linear or lanceolate. Scape solid, angled or flattened and ridged. Inflorescence umbellate, subtended by spathe-like, lanceolate, membranaceous bracts. Flowers sessile or slightly stalked or becoming so in fruit, each flower with 2 narrow, membranaceous bracts; perianth united below into a long, cylindrical tube, the 6 lobes spreading or recurved, linear, white; stamens 6, the filaments free above, united below into a long, cylindrical, flaring or undulate cup, often with processes between the filaments, the anthers linear, versatile; ovary 3-celled, with 2 or more ovules in each locule, the style filiform, long-exserted, the stigma capitate. Capsule fleshy; seeds 1 or 2 per locule, large, green and fleshy.

LECTOTYPE SPECIES: *Hymenocallis littoralis* (Jacq.) Salisb., based on *Pancratium littorale* Jacq.

An American genus of about 50 species found in warm climates. For more information on the genus see J. R. Sealey, Review of the genus *Hymenocallis*, in Kew Bull. 1954: 201-240. 1954; and *Hymenocallis*, in Royal Horticultural Society Dict. Gardn. Suppl. 358-360. 1969.

KEY TO THE SPECIES

1. Leaf blades shortly narrowed to or abruptly set off from a well-marked petiole 6-30 cm. long, broadly elliptic to ovate, cuneate at the base, 20-46 cm. long, 6-15 cm. wide. 2
- 1a. Leaves linear or lorate or ensiform, long-tapering at the base, 10-60 cm. long, 1-5 cm. wide. 3
2. Leaf blades 32-33 cm. long, 6-8 cm. wide; petioles 6-7 cm. long. *H. fragrans*
- 2a. Leaf blades 26-65 cm. long, 8-15 cm. wide; petioles 9-30 cm. long. *H. speciosa*
3. Perianth tube 4.0-6.5 cm. long, shorter than the segments. *H. caribaea*
- 3a. Perianth tube 8-11 cm. long, the segments 9-15 cm. *H. expansa*

Hymenocallis caribaea (L. emend. Gawl.) Herb. in Edw. Bot. Reg. 7(App.): 44. 1821.

Basionym: *Pancratium caribaeum* L., Sp. Pl. 1: 291. 1753; Fournet, Fl. Guadeloupe Martinique 238. 1978.

Lectotype: Commelinus, Horti Med. Amstel. Rar. Pl. Descr. Ic. 2: 173, t. 87. 1701, with Curtis Bot. Mag. 21: t. 826. 1805 a good modern representation.

~ Syn.: *Pancratium declinatum* Jacq., Select. Stirp. Amer. Hist. 99. 1763. (Type locality: Martinique and Cayenne.)

Herb of sandy coastal areas. Leaves many, green, ensiform or suboblong, 30-60 cm. long, 5.0-7.5 cm. wide, tapered to an acute apex, slightly narrowed at the base. Scape 30-60 cm. long; bracts ovate to lanceolate, 3-6 cm. long. Flowers 8-10 or more, fragrant; perianth tube 4.0-6.5 cm. long,

tepals 9-11 cm. long, white; staminal cup funnel-shaped, margins erect, 2-3 cm. high, the filaments 3-5 cm. long. Fruit globose, 1.5-2.0 cm. in diameter, lobed.

GENERAL DISTRIBUTION: Jamaica, St. Croix.

DISTRIBUTION IN LESSER ANTILLES: Anguilla!, St. Martin!, St. Barts!, Antigua!, Saba!, St. Eustatius!, St. Kitts!, Montserrat!, Guadeloupe!, Marie Galante!, Martinique!, St. Lucia!, St. Vincent!, the Grenadines!, Grenada!, Barbados!.

COMMON NAMES: Lily, spider lily, leli, white lily, lis blanc, oignon de lis, lis à l'huile.

Hymenocallis expansa (Herb.) Herb. in Edw. Bot. Reg. 7(App.): 44. 1821.

Basionym: *Pancratium expansum* Herb. in Curtis Bot. Mag. 44: t. 1941. 1817.

Type: Curtis Bot. Mag. 44: t. 1941.

Syn.: *Hymenocallis expansa* var. *dominicensis* Traub, Plant Life 18: 62. 1962, illeg.

A large, vigorous plant with numerous evergreen leaves. Leaves 40-77 cm. long, broad, oblong-ensiform or narrowly and obliquely oblong-elliptic or -oblanceolate, 3.8-7.5 cm. wide in upper part, tapering to the acute apex and more gradually tapered to the lowest quarter, which is distinctly narrower, 2.8-3.0 cm. wide in lowermost quarter. Scape 40-60 cm. high. Flowers 10-20, sessile; perigone tube 8.0-10.6 cm. long, the segments 9.0-14.5 cm. long; staminal cup narrowly funnel-shaped with margins erect, 2.7-3.5 cm. high, somewhat tubulose in the lowest third and widened above, 2.5 cm. wide at the mouth, somewhat fluted and with a large, usually bifid tooth between the filaments; filaments 4.5-6.0 cm. long. Fruit not described.

GENERAL DISTRIBUTION: Hispaniola, Puerto Rico.

DISTRIBUTION IN LESSER ANTILLES: Dominica!, Martinique!.

Hymenocallis fragrans (Salisb.) Salisb. in Trans. Hort. Soc. London 1: 340. 1812.

Basionym: *Pancratium fragrans* Salisb. in Trans. Linn. Soc. London 2: 72, t. 11. 1794.

Lectotype: Trans. Linn. Soc. London 2: t. 11. 1794.

Leaves 7-10, about 40 cm. long, shortly and broadly petiolate, the petioles 6-7 cm. long, about 2 cm. wide; blades elliptic or oblong-elliptic, acute, cuneate at base, 32-33 cm. long, 6.3-8.0 cm. wide. Scape 40-45 cm. high. Flowers 7-12, shortly and stoutly pedicellate, the pedicels to 5 mm. long; perianth tube 6-8 cm. long, tepals 8-10 cm. long; staminal cup funnel-shaped, 2.0-2.5 cm. long, margins erect and entire, the filaments 3.5-4.5 cm. long; ovary with 2 ovules in each cell. Fruit not described.

GENERAL DISTRIBUTION: Native of the West Indies, but known only in cultivation.



FIGURE 106. Amaryllidaceae. a-c, *Hymenocallis fragrans*: a, habit, $\times 0.1$; b, leaf, $\times 0.3$; c, inflorescence, $\times 0.5$.

DISTRIBUTION IN LESSER ANTILLES: Nevis!, Martinique!, Barbados.

OBSERVATION: The description and illustration by Stehlé (Fl. Agron. Ant. Fr. 3: 162-165. 1960) called *Hymenocallis arenicola* is undocumented by specimens and may be referred to this species. Fournet (Fl. Guadeloupe Martinique 238. 1978) recognizes *Pancratium arenicolum*, which may also be referred to this species.

Hymenocallis speciosa (Salisb.) Salisb. in Trans. Hort. Soc. London 1: 340. 1812.

Basionym: *Pancratium speciosum* Salisb. in Trans. Linn. Soc. London 2: 73, t. 12. 1794.

Lectotype: Trans. Linn. Soc. London 2: t. 12.

Leaves evergreen, several, rosulate, the 7-9 new leaves of the current year well developed at flowering time, arising in the middle of the leaves of the previous season, distinctly petiolate, very variable in size, 38-60 cm. long; petioles broad, 9-17 cm. long; blades broadly elliptic or broadly oblong-elliptic, shortly acute, cuneate at base, 26-46 cm. long, 8.0-13.3 cm. wide. Scape 30-40 cm. high, glaucous, ancipitous. Flowers 7-12, wide-spreading, pedicellate, the pedicels to 1 cm. long; perigone tube 7-9 cm. long, the segments 9.5-11.5 (sometimes 12.5-15.0) cm. long; staminal cup funnel-shaped, 2.5-3.5 cm. long, toothed between the filaments; filaments almost erect, 3.0-4.5 cm.; ovary with 2 ovules in each cell.

GENERAL DISTRIBUTION: Native of the West Indies but known only in cultivation.

DISTRIBUTION IN LESSER ANTILLES: Dominica!, St. Vincent!, the Grenadines!, Grenada!.

Hymenocallis humilis S. Wats. was cultivated in Guadeloupe in 1905 (Duss 4210).

ZEPHYRANTHES Herbert

Zephyranthes Herb. in Edw. Bot. Reg. 7(App.): 36. 1821, nom. cons.

FIGURE 107.

Syn.: *Atamasco* Adans., Fam. Pl. 2: 57, 522. 1763.

Plants with tunicated bulbs. Leaves few to several, linear, flat or channeled, glabrous, appearing with the flowers or after them. Scape 1-flowered, spathe-like bracts 2, variously united. Flowers with pedicel longer or shorter than the spathe; perianth funnelform, erect or ascending, white, pink, red or yellow, the 6 lobes subequal; stamens 6, equal or nearly so, the filaments glabrous, adnate to the perianth tube, the anthers versatile; ovary glabrous, 3-celled with numerous ovules in 2 rows in each locule, the style filiform, 3-parted or 3-lobed. Capsule 3-celled, loculicidally 3-valved; seeds black, flattened.

TYPE SPECIES: *Zephyranthes atamasco* (L.) Herbert, based on *Amaryllis atamasco* L., typ. cons.

A genus comprised of 35 to 40 species, distributed in the warm climates of the West Indies and America.

KEY TO THE SPECIES

1. Flowers yellow. *Z. citrina*
- 1a. Flowers white, red or pink. 2
2. Flowers white. 3
- 2a. Flowers red or pink. 4
3. Flowers erect, pedicel shorter than the spathe. *Z. candida*
- 3a. Flowers ascending, pedicels exceeding the spathe. *Z. puertoricensis*
4. Pedicels shorter than the spathe, flowers 6.0-7.5 cm. *Z. grandiflora*
- 4a. Pedicels longer than the spathe, flowers 3.0-3.5 cm. long. *Z. rosea*

***Zephyranthes candida* (Lindl.) Herbert** in Curtis Bot. Mag. 53: pl. 2607. 1826.

Basionym: *Amaryllis candida* Lindley in Edw. Bot. Reg. 9: pl. 724. 1823.

Type: Cultivated plant from Peru, represented by Edw. Bot. Reg. 9: pl. 724. 1823.

Bulbous herb; bulbs 2.5 cm. in diameter, the neck stout, elongate. Leaves linear, to 25 cm. long and 3 mm. wide, channeled, apex obtuse. Scape to 20 cm. long; spathe bracts to 5 cm. long. Flowers with pedicels 1 cm. long; perianth erect, white and tinged with rose and green at the base, the tube to 1.5 cm. long; tepals 3-4 cm. long; stigma 3-lobed. Capsule not described.

GENERAL DISTRIBUTION: Native of South America, reported in cultivation in tropical countries.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe!, Martinique!.

***Zephyranthes citrina* Baker** in Curtis Bot. Mag. 108: t. 6605. 1882.

Type: Cultivated plant from Demerara, represented by Curtis Bot. Mag. 108: t. 6605.

- c Syn.: *Zephyranthes eggersiana* Urban, Symb. Antill. 5: 292. 1907. (Type: Syntypes cited, no holotype designated.)

Zephyranthes aurea (Ruiz & Pavon) Baker, Handb. Amaryll. 37. 1888, nom. illeg.; Stehlé in Bull. Soc. Bot. France 123: 446. 1976; Fournet, Fl. Guadeloupe Martinique 234. 1978.

Herb with bulb 2.5 cm. in diameter, the neck narrow, elongate. Leaves 4 or 5, narrowly linear, 15-32 cm. long, 2-3 mm. wide, channeled, apex obtuse. Scape 10-25 cm. long, spathe bracts 2 cm. long. Flowers erect, with pedicels 2-4 cm. long, exceeding the bracts in fruit; perianth 3-4 cm. long, yellow except for short greenish tube; style shorter than the stamens, the stigma capitate, 3-lobed. Capsule depressed, 1 cm. in diameter.

GENERAL DISTRIBUTION: Mexico, Central America, Cuba, Hispaniola, northern South America.



FIGURE 107. Amaryllidaceae. *Zephyranthes citrina*, $\times 0.6$.

DISTRIBUTION IN LESSER ANTILLES: St. Martin, St. Barts!, Antigua!, Saba, Guadeloupe!, Dominica!, St. Lucia!, Barbados!.

COMMON NAMES: Petit lis jaune, yellow crocus.

Zephyranthes grandiflora Lindl. in Edw. Bot. Reg. 11: *pl.* 902. 1825.

Type: Cultivated plant from Mexico represented by Edw. Bot. Reg. 11: *pl.* 902.

Syn.: *Amaryllis carinata* Spreng., Syst. Veg. ed. 16. 5: 152. 1828; Griseb., Fl. Br. W. Ind. Isl. 584. 1864.

Zephyranthes carinata Herbert in Curtis Bot. Mag. 52: *t.* 2594. 1825; Stehlé in Bull. Soc. Bot. France 123: 446. 1976; Fournet, Fl. Guadeloupe Martinique 234. 1978. (Type: Curtis Bot. Mag. 52: *t.* 2594.)

Atamosco carinata (Herb.) Wilson in Britton & Wilson, Sci. Surv. Porto Rico 5(1): 159. 1924.

Herbs; bulbs ovoid, to 2.5 cm. in diameter, the neck short. Leaves linear, 15–30 cm. long, 2–5 mm. wide. Scape slender, 10–30 cm. long; spathe bracts 3–5 cm. long. Flowers with pedicels shorter than the spathe; perianth erect, bright rose-red, the tube 1.4–2.0 cm. long; tepals 4–6 cm. long, 12–20 mm. broad; stamens half the length of the perianth; style deeply trifid. Mature fruit not described.

GENERAL DISTRIBUTION: Mexico, Central America, Greater Antilles, northern South America.

DISTRIBUTION IN LESSER ANTILLES: Saba, St. Eustatius, Guadeloupe, Martinique.

COMMON NAMES: Petit lis rose, lis a bordures.

Zephyranthes puertoricensis Traub, Plant Life 7: 37, 38. 1951; Taxon 10: 109–113. 1958.

Neotype: *Traub 151* (TRA).

Syn.: *Amaryllis tubispatha* Ker-Gawl. in Curtis Bot. Mag. 38: *t.* 1586. 1813, non L'Herit.

Zephyranthes tubispatha Herb. in Edw. Bot. Reg. 7(App.): 36. 1821; Sealey in Bot. Mag. 170: *t.* 232. 1954; Gooding *et al.*, Fl. Barbados 106. 1965; Stehlé in Bull. Soc. Bot. France 123: 446. 1976. (Type: Curtis Bot. Mag. 38: *t.* 1586.)

Herb; bulb subglobose 2.0–2.5 cm. in diameter, the neck stout. Leaves 3, linear, 12–17 cm. long, 5–6 mm. wide, apex obtuse. Scape 11–18 cm. long; spathe bracts 2–3 cm. long, strongly bifid at apex. Flowers ascending; perianth white, tinged with green at base, the tube 2–4 mm. long; tepals 4–5 cm. long; stamens shorter than the perianth; style deeply trifid. Fruit a capsule, 11 mm. in diameter.

GENERAL DISTRIBUTION: Greater Antilles, Tobago, Colombia, Venezuela.

DISTRIBUTION IN LESSER ANTILLES: St. Martin, Antigua, Barbuda!, Saba, St. Eustatius!, Montserrat!, Guadeloupe!, Martinique!, St. Lucia!, St. Vincent!, Barbados.

COMMON NAMES: Barbados snow drop, white snowdrop, petit lis blanc, lis-savane, sibojitu.

Zephyranthes rosea Lindl. in Edw. Bot. Reg. 10: t. 821. 1824.

Type: Cuba, represented by Edw. Bot. Reg. 10: t. 821.

Syn.: *Atamosco rosea* (Lindl.) Greene in Pittonia 3: 188. 1807.

Bulb 2.0–2.5 cm. in diameter, the neck short, slender. Leaves about 5, linear, 15 cm. long, 2–5 mm. wide, flat, apex obtuse. Scape 10–25 cm. long, spathe bracts 2.5 cm. Flowers erect, with pedicel 3.0–3.5 cm. long; perianth 2.5–3.5 cm. long, rose-red, greenish at base; stigmas 3-lobed. Capsule not described.

GENERAL DISTRIBUTION: Central America, Greater Antilles.

DISTRIBUTION IN LESSER ANTILLES: St. Martin, St. Eustatius, Guadeloupe!, Martinique!.

COMMON NAMES: Leli di San Jose, sibojitu, crocus, kleine penpen.

SPECIES IN CULTIVATION

Eurycles amboinensis (L.) Lindl.

This species is reported to be in cultivation in St. Martin, St. Eustatius and Saba by Fr. Arnoldo (Gekw. Nutt. Pl. Neder. Antill. 70. 1971) and in the French islands by Fournet (Fl. Guadeloupe Martinique 239. 1978) under the synonymous name *Eurycles sylvestris* Salisb.

Haemanthus multiflorus Martyn.

Reported by Fournet (Fl. Guadeloupe Martinique 239. 1978) as occasionally cultivated in the French islands. The plants commonly flower before the leaves are produced; they are considered so unusual that permission to obtain herbarium specimens has not been obtained.

AGAVACEAE

AGAVACEAE Endlicher, Enchiridion 105. 1841.

Rhizomatous perennial herbs and acaulescent rosette plants or branched or unbranched arborescent forms. Leaves spiral, occurring basally or near the apex, narrow and rigid or membranous or leathery, often with a sharp, terminal spine and marginal prickles. Inflorescence spicate, racemose or paniculate. Flowers perfect; perianth regular to zygomorphic; tepals free or united basally; stamens 6; ovary superior or inferior, 3-celled, with one to many ovules, the style commonly slender. Fruit usually a loculicidal or fleshy capsule or a berry; seeds numerous or solitary, flattened or spherical.

TYPE GENUS: *Agave* Linnaeus.

A tropical and subtropical family of 20 genera and about 670 species.

KEY TO THE GENERA

1. Herbaceous plants, spreading by rhizomes, upright stem short; leaves less than 12, leathery, without terminal spine or marginal prickles; inflorescence racemose; ovary superior, the ovules solitary. *Sansevieria*
- 1a. Shrubby or arborescent plants with many leaves in an acaulescent rosette or with fewer leaves spread along an upright stem. 2
2. Leaves 30-60 in a rosette, 1-2 m. long, thick, spine-tipped and usually with marginal prickles; inflorescence paniculate, usually several meters tall; inflorescence often bulbiferous. 3
- 2a. Leaves borne along an elongated stem which is often naked below; inflorescence less than 1 m. long, not bulbiferous. 4
3. Flowers yellow or rarely green, erect, the stamens exserted. *Agave*
- 3a. Flowers white, pendulous, the stamens included. *Furcraea*
4. Perianth segments free, 2.5-9.0 cm. long; leaves narrowly lanceolate, rigid, spine-tipped; fruit a berrylike capsule, ovules and seeds numerous. *Yucca*
- 4a. Perianth segments united at the base, 1-2 cm. long; leaves broad, membranous, not spine-tipped. 5
5. Leaves sessile, lanceolate; ovules solitary. *Dracaena*
- 5a. Leaves petiolate, elliptical; ovules numerous. *Cordyline*

AGAVE Linnaeus

Agave L., Sp. Pl. 1: 323. 1753.

FIGURE 108.

Rosette plants, acaulescent or surculose, monocarpic, perennial. Leaves large, succulent, fibrous, spine-tipped, the margins slightly to densely armed with prickles. Inflorescence paniculate, generally several meters tall; rachis with spine-tipped bracts, often bulbiferous; branches with flowers in cymose or umbellate clusters. Flowers large, yellow or green, proterandrous; perianth tubular at the base, the segments imbricate in bud, erect, rarely reflexed; stamens 6, exserted, the filaments long, the anthers versatile; ovary inferior, 3-celled, with numerous ovules in two rows, the style elongate, the stigma 3-lobed. Fruit (if formed) a dehiscent, loculicidal capsule; seeds flattened, black or conspicuously alternating with abortive white seeds.

TYPE SPECIES: *Agave americana* L.

A genus of about 300 species distributed from the southern United States to tropical South America. Results of further studies by the author on the genus *Agave* in the Lesser Antilles are scheduled to be published later this year.

KEY TO THE SPECIES

1. Leaf margins undulate, the marginal spines to 1 cm. long, borne or dilated bases of leaf tissue; terminal spines to 4 cm. long, black, shiny and sharp. 2
- 1a. Leaf margins straight, prickles 1-3 mm. long, lenticular, either separate or connected in a colored margin. 3

2. Leaves whitish gray-green, strongly arching and often recurved; cultivated ornamental specimen plants. *A. beauleriana*
- 2a. Leaves gray-green, erect; specimen plants or often used in hedgerows; capsule black, open segments to 6 cm. long, 2.5 cm. wide. *A. americana*
3. Rhizomatous plants, suckering from the base; inflorescence bulbiferous; leaves rigid and straight. 4
- 3a. Acaulescent plants, not suckering from the base or forming clusters; flowers golden yellow. 5
4. Leaves 40-75 cm. long; flowers greenish yellow; fruit globose. *A. angustifolia*
- 4a. Leaves 1.0-1.5 m. long; flowers gray-green, anthers brown-spotted; rarely fruiting, the capsule reported as oblong. *A. sisalana*
5. Flowers abortive on maturity, not producing fruits. 6
- 5a. Flowers producing fruit; bulbils present or wanting. 8
6. Leaves arching, heavy, to 2.5 m. long, 25-30 cm. broad; leaf tip with heavy apex, the ultimate tip pointed; bulblets produced on rachis. . . . *A. barbadensis*
- 6a. Leaves erect or twisted, relatively thin; bulblets produced in inflorescence, not on rachis. 7
7. Leaves erect and arching, terminal spine with involute base, ultimate tip black, shiny, 5-7 mm. long. *A. scheuermaniana*
- 7a. Leaves erect and twisting, blade flat, rarely involute below a black spine with conspicuous unguiculate base, 2 cm. long. *A. caribaeicola*
8. Fruit short, oblong, 20-30 mm. long, ovary 2.5 cm. long in flower; bulbils produced. *A. van grolae*
- 8a. Fruit oblong, 4-5 cm. long; ovary 30-35 mm. long in flower. 9
9. Fruit with distinctly stipitate base 1 cm. long; bulbils not known. *A. dussiana*
- 9a. Fruit with short base, stalk 2-3 mm. long; freely bulbiferous. *A. karatto*

Agave americana L., Sp. Pl. 1: 323. 1753.

Type: A cultivated plant (LINN 443.1—flowers only).

Acaulescent herbs. Leaves oblanceolate, 1-2 m. long, 15-20 cm. broad, ascending, usually straight, glaucous, the apical spine 3-4 cm. long, solid and grooved at the base, the marginal prickles 7-10 mm. long, gray, curved or sinuous, elevated on fleshy bases, the leaf blade slightly undulate between the prickles. Inflorescence to 10 m. tall, not bulbiferous. Flowers yellow. Capsule oblong, to 6 cm. long, 3 cm. in diameter, short-stipitate and apiculate.

GENERAL DISTRIBUTION: Thought to be native to Mexico, now widely cultivated.

DISTRIBUTION IN LESSER ANTILLES: Antigua!, Guadeloupe, Martinique.

OBSERVATIONS: The association of this specific name with plants of the Lesser Antilles is at best speculation. Specimens seen were not identified by specialists who understand the typification of the species in Mexican populations.

Agave angustifolia Haw., Syn. Pl. Succ. 72. 1812.

Neotype: T. Tozzetti in Ann. Mus. Imp. Firenze 2(2): 25, 31-35, *pl.* 6. 1810, a cultivated plant of unknown origin from St. Helena (fide Trelease, in Missouri Bot. Gard. Rep. 19: *pl.* 30. 1908).

Acaulescent rosette plants sometimes developing a short trunk, freely surculose. Leaves narrowly linear to lanceolate, 40-75 cm. long, 3.5-8.0 cm. wide, the apical spine 2.5-4.0 cm. long, reddish-brown, the upper surface flattened, the marginal prickles black, 3-5 mm. long, upcurved, sinuous or recurved from a black deltoid base. Inflorescences to 3 m. tall; bracts spreading, elongated into narrow tips; pedicels less than 5 mm. long. Flowers greenish-yellow, 4-5 cm. long. Capsule subglobose to broadly ovoid, 3.0-3.5 cm. in diameter, apex turbinate. Bulbils usually produced on the upper and lower branches of the inflorescence.

GENERAL DISTRIBUTION: Apparently native to Mexico.

DISTRIBUTION IN LESSER ANTILLES: St. Martin!, Barbados!.

OBSERVATIONS: All plants seen were under cultivation or persisting along fence rows of roadsides, suggesting former planting. *A. angustifolia* var. *marginata* Trel., with white or pale yellow leaf margins, was seen mixed with plants having completely green leaves.

Agave barbadensis Trel. in Mem. Nat. Acad. Sci. Washington 11: 28. 1913.

Type: Not designated from the several specimens cited.

Acaulescent rosette plant, moderately surculose. Leaves broadly lanceolate, curved outward, 1.5-2.5 m. long, 25-30 cm. wide at the base, up to 20 cm. thick at the base, the apical spine blackish-brown at the curved tip, involute at the base, 1.0-1.5 cm. long, the marginal prickles distinct, 2-3 mm. long, straight or curved. Inflorescence 5-6 m. tall, the branches freely and densely bulbiferous. Flowers yellow, aborting before completely open. Fruit unknown.

GENERAL DISTRIBUTION: Endemic to the Lesser Antilles.

DISTRIBUTION IN LESSER ANTILLES: Barbados.

COMMON NAME: Maypole.

OBSERVATIONS: Trelease stated that *Agave barbadensis* was spontaneous on the leeward side of Barbados and planted everywhere in hedgerows, from which it had escaped. In 1977, the present author noted it in apparently spontaneous growth in the dune area near Belleplaine, however, in other areas its occurrence is associated with evidence of former habitation or cultivation. Flowering material was infrequent, and in most cases the flowers aborted before maturity. Trelease supplied dimensions for floral parts, suggesting this had the largest flowers of the Antillean species, but

in recent collecting trips flowers of comparable size could not be found. No fruits were seen and, according to the local residents, none are produced.

Agave beauleriana Jacobi, Abh. Schles. Ges. Vaterl. Cult. 150. 1869.

Type: Cultivated plant in Holland, thought to be from Mexico.

Syn.: *Agave franzosini* J. G. Baker in Kew Bull. 1892: 3. 1892. (Type: Cultivated plant in Europe said to be from Mexico.)

Acaulescent, often surculose herb. Leaves obovate-lanceolate in large rosette, ascending and strongly outcurved and arching, to 2.5 m. long, 17 cm. wide at the base and 15-34 cm. thick (wide) at middle, white- to blue-gray, the apical spine to 7.5 cm. long, basal portion grooved, the leaf margin undulate, the base abruptly broadened, the spine broadly triangular, straight or curved, 6 mm. long. Inflorescence reported to 10 m. tall. Flowers yellow, although not known to flower in the Lesser Antilles.

GENERAL DISTRIBUTION: Cultivated in tropical areas.

DISTRIBUTION IN LESSER ANTILLES: St. Martin!, Saba!, Grenada!

Agave caribaeicola Trel. in Mem. Nat. Acad. Sci. Washington 11: 27. 1913.

Type: Martinique, *Hahn 114*.

Syn.: *Agave caribaea* Baker, Gard. Chron. 2: 683. 1877, non Deleuil, 1875.

Agave grenadina Trel. in Mem. Nat. Acad. Sci. Washington 11: 25. 1913.
(Type: Grenada, *Anstead C/29/1908*.)

Agave medioxima Trel. in Mem. Nat. Acad. Sci. Washington 11: 24. 1913.
(Type: Dominica, *Jones 1910*.)

Agave unguiculata Trel. in Mem. Nat. Acad. Sci. Washington 11: 29. 1913.
(Type: St. Lucia, *Moore 1*.)

Agave ventum-versa Trel. in Mem. Nat. Acad. Sci. Washington 11: 29. 1913.
(Type: St. Vincent, *Sands 1909*.)

Acaulescent herb. Leaves lanceolate, 1-2 m. long, 10-20 cm. wide, ascending, curved and twisted, the apical spine black, 20-25 mm. long, conical and grooved or involute, the marginal teeth minute, 1-3 mm. long, commonly with intermediate smaller prickles. Inflorescences 3-5 m. tall. Flowers yellow, not known to produce fruit, bulbiferous in the flowering axes.

GENERAL DISTRIBUTION: Endemic to the Lesser Antilles.

DISTRIBUTION IN LESSER ANTILLES: Martinique!, St. Lucia!, St. Vincent!, the Grenadines!, Grenada!

COMMON NAMES: Lapitte, langue boeuf.

Agave dussiana Trel. in Mem. Nat. Acad. Sci. Washington 11: 26. 1913.

Type: Guadeloupe, *Duss 3961*.

Syn.: *Agave montserratensis* Trel. in Nat. Acad. Sci. Washington 11: 24. 1913.
(Type: Montserrat, *Robson No. 1*, 1908-1909.)

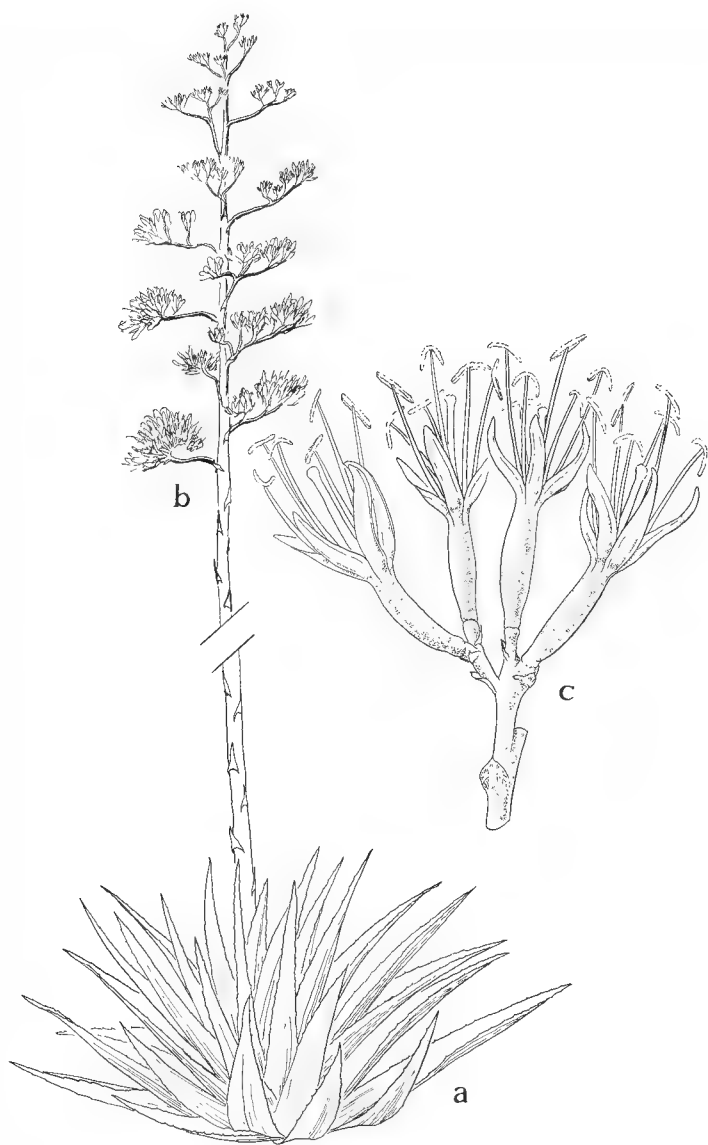


FIGURE 108. Agavaceae. a-c. *Agave caribbaeicola*: a, habit base, $\times 0.02$; b, inflorescence, $\times 0.02$; c, flower cluster, $\times 0.5$.

Rosette plant, acaulescent and not surculose. Leaves lanceolate, 1.0-1.6 m. long, erect, arching, slightly concave, the apical spine black, gradually pointed, 5-7 mm. long, the base involute, the marginal prickles 2-3 mm. long, straight, curved or recurved. Inflorescence 5-9 m. tall. Flowers yellow; ovary 30-35 mm. long. Capsule narrowly oblong, 3.0-4.5 cm. long, 2 cm. in diameter, stipitate at the base, the stalk to 1 cm. long, slightly beaked at the apex. Bulbils lacking in the floral branches but occasionally produced in the lower bracts of the rachis.

GENERAL DISTRIBUTION: Endemic to the Lesser Antilles.

DISTRIBUTION IN LESSER ANTILLES: St. Barts!, Antigua!, Montserrat!, Guadeloupe!, Martinique!.

Agave karatto Miller, Gard. Dict. ed. 8. *Agave* no. 6. 1768.

Type: Described from a cultivated plant introduced from St. Kitts.

Syn.: *Agave obducta* Trel. in Mem. Nat. Acad. Sci. Washington 11: 25. 1913. (Type: Antigua, Jackson, in 1908.)

Acaulescent herb, not surculose. Leaves lanceolate, 1.3-1.7 m. long, ca. 20 cm. wide, erect, arching, concave above, the apical spine black, involute, 10-15 mm. long, the ultimate apex recurved-mucronate, 3-4 mm. long, the marginal prickles 2-3 mm. long, straight or variously curved or reflexed. Inflorescence 5-6 m. tall. Flowers yellow; ovary 3.0-3.5 cm. long, freely bulbiferous in the floral axis. Capsules broadly oblong, to 4.5 cm. long, 2.0 cm. in diameter, the basal stalk 2-3 mm. long, the apex short-beaked.

GENERAL DISTRIBUTION: Endemic to the Lesser Antilles.

DISTRIBUTION IN LESSER ANTILLES: Antigua!, Barbuda!, Saba!, St. Kitts!, Montserrat!, La Desirade!.

Agave scheuermaniana Trel. in Mem. Nat. Acad. Sci. Washington 11: 25. 1913.

Type: St. Martin, *Scheuerman* 1910.

Acaulescent rosette-forming plants, apparently not surculose. Leaves lanceolate, 1.50-1.75 m. long, ascending, outcurving, strongly concave, gray-green, the apical spine dark, slenderly awl-shaped, 5-7 mm. long, with brown involute base, the marginal prickles brown, 2 mm. long, mostly recurved. Inflorescence to 7 m. tall. Flowers yellow, mostly aborting, no fruit produced, the flowering branches freely bulbiferous.

GENERAL DISTRIBUTION: Endemic to the Lesser Antilles.

DISTRIBUTION IN LESSER ANTILLES: Known only from St. Martin(!) and Anguilla(!).

Agave sisalana Perrine, U. S. House Rep. Document 564: 8. 1838; U. S. Senate, 25th Congress Sess. 2, Document 300. pl. 1, 2, 4. 1838.

Type: A plant cultivated in Florida from material introduced from Campeche, *Perrine s.n.* (NY).

Plants acaulescent or with a short caudex, commonly suckering from the base. Leaves linear-lanceolate, the upper strict, the lower often reflexed, to 1.5 m. long, 10-12 cm. wide, glaucous gray-green, becoming green, the margins smooth or armed with small prickles, the apical spine conical, shallowly round-grooved at the base, black, 2.0-2.5 cm. long, 4-5 mm. thick. Inflorescence to 8 m. tall. Flowers 2 or 3 together on the numerous branches of the panicle; perianth 4-6 cm. long, yellowish-green; stamens inserted at the level of perianth fusion, the filaments linear, red-spotted, 7.5-8.0 cm. long, the anthers versatile, brown-spotted, 2.5-2.7 cm. long; ovary 20-25 mm. long with tube 15-20 mm., the style becoming 7-8 cm. long. Fruit rarely formed, capsule oblong, to 6 cm. long, 2.0-2.5 cm. thick, stipitate and beaked. Bulbils common in axils of bracts below the flowers.

GENERAL DISTRIBUTION: Cultivated in South America, Central America, Greater Antilles, and Mexico, where it is also native.

DISTRIBUTION IN LESSER ANTILLES: St. Martin!, St. Barts!, St. Kitts!, Nevis!, Montserrat!, Grenada!, Barbados!.

OBSERVATIONS: No fruiting specimens have been seen in the Lesser Antilles. Young inflorescences are often cut to prevent flowering, which apparently forces the development of rhizomes and suckers as well as the production of many short, thin inflorescences from the axils of the lower leaves of the rosette.

Agave van grolae Trel. in Mem. Nat. Acad. Sci. Washington 11: 24. 1913.

Type: St. Eustatius, *Mrs. Van Grol* "1909, 1910, the type."

Syn.: *Agave nevidis* Trel. in Mem. Nat. Acad. Sci. Washington 11: 24. 1913. (Type: Nevis, *Maloney* 1910.)

Acaulescent, nonsurculose, rosette herb. Leaves lanceolate, to 2 m. long, erect and slightly arching, strongly concave, the apical spine compressed-conical from an involute base, 10-15 mm. long, with ultimate apex an apiculum 2-3 mm. long, the marginal prickles 2 mm. long, straight or variously curved or recurved. Inflorescence to 10 m. tall, to 20 cm. in diameter at the base. Flowers golden yellow; ovary 2.5 cm. long. Fruit oblong, 20-30 mm. long, 20 mm. in diameter, short-stipitate and apiculate, the flowering axes freely bulbiferous.

GENERAL DISTRIBUTION: Endemic to the Leeward Islands.

DISTRIBUTION IN LESSER ANTILLES: St. Eustatius!, St. Kitts!, Nevis!.

CORDYLINE Commerson ex A. L. Jussieu

Cordyline Commerson ex Jussieu, Gen. 41. 1789, nom. cons. FIGURE 109.

Syn.: *Taetsia* Medic., Theodora 82. 1786.

Shrubby erect plants with woody stems, often stoloniferous. Leaves crowded near apex, petiolate or subsessile. Inflorescence paniculate; bracts scarious, small. Flowers short-pedicellate; perianth cylindrical or narrowly campanulate, the tube short, the lobes oblong, erect or spreading; stamens 6, inserted at base of lobes, the filaments filiform or flattened; ovary sessile, 3-celled, with 4-12 ovules per cell, the style filiform, the stigma capitate or 3-lobed. Fruit globose, fleshy, 3-celled, indehiscent; seeds numerous, compressed, black and lustrous.

TYPE SPECIES: *Cordyline fruticosa* (L.) A. Chev., based on *Convallaria fruticosa* L.

A genus of 15 species found in tropical and warm temperate climates.

Cordyline fruticosa (L.) A. Chev., Cat. Pl. Jard. Bot. Saigon 66. 1919.

Basionym: *Convallaria fruticosa* L. in Stickman, Herb. Amboin. 16. 1754; Amoen. Acad. 4: 126. 1759.

Type locality: Tropical Asia.

Syn.: *Asparagus terminalis* L., Sp. Pl. ed. 2. 450. 1762. (Type locality: India.)

Cordyline terminalis (L.) Kunth in Abh. Königl. Acad. Wiss. Berlin 30. 1820.

Taetsia fruticosa (L.) Merrill, Interp. Herb. Amboin. 137. 1917.

Plants 1-3 m. tall, leafy near the apex. Leaves with petioles 15-30 cm. long; blades elliptic- to linear-lanceolate, 30-70 cm. long, 10-15 cm. wide, the apex acute to attenuate, the base narrowed, green to deep purple or red, often green with red margins. Panicles terminal, densely flowered. Flowers with perianth white, purple or red, 10-12 mm. long, the lobes linear-oblong. Fruit a berry, red or purple.

GENERAL DISTRIBUTION: Native of Malaya, widely planted in tropical areas.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe!, Martinique!, St. Lucia!.

DRACAENA Vandelli ex Linnaeus

Dracaena Vandelli ex L., Syst. Nat. ed. 12. 2: 246. 1767. FIGURE 110.

Trees or shrubs with thick woody stems. Leaves leathery, not rigid, closely parallel-veined, crowded along branches or at the ends of branches. Inflorescence paniculate. Flowers closely aggregated in pseudoumbels along the branches; bracts scarious, small; perianth funnelform with short tube, the lobes narrow, subequal; stamens 6, borne on tube at base of lobes, the filaments terete or flattened; ovary sessile, 3-celled, the style filiform, the stigma capitate. Fruit baccate, usually 1-seeded.

LECTOTYPE SPECIES: *Dracaena draco* (L.) L., based on *Asparagus draco* L.

An Old World genus of about 150 species found in warm climates.

Dracaena fragrans (L.) Ker-Gawl. in Curtis Bot. Mag. 27: t. 1081. 1808.



FIGURE 109. Agavaceae. *Cordyline fruticosa*, $\times 0.1$.

Basionym: *Aletris fragrans* L., Sp. Pl. ed. 2. 456. 1762.

Type: Commerson, Hort. Amst. 1: 93, fig. 49; 2: fig. 4, no. 1, fig. 5, no. 2. Locality: Africa.

Syn.: *Pleomele fragrans* (L.) Salisb., Prodr. 245. 1796.

Plants to 8 m. tall, the woody stems to 10 cm. in diameter, with leaf scars conspicuous. Leaves broadly linear, to 1 m. long, 10 cm. wide, rounded or acute at the apex, sessile or rarely narrowed slightly at the base. Inflorescence panicate. Flowers yellow or white, often with pink stripe, intensely fragrant; perianth lobes to 2.5 cm. long. Fruit red-orange, 9-13 mm. in diameter.

GENERAL DISTRIBUTION: Native of Africa introduced and cultivated in American tropics.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe!, Martinique!, St. Vincent!, Grenada!, Barbados!.

COMMON NAMES: Sanddragon, dracene.

OBSERVATIONS: Most often cultivated in hedgerows, plants are decapitated to establish height and frequently have adventitious shoots developing along the leafless stem or at the apex.

Fournet (Fl. Guadeloupe Martinique 225-227. 1978) reported the following species under cultivation in the French islands: *D. sanderiana* Hort., *D. draco* L., *D. umbraculifera* Jacq. and *D. marginata* Lam. Duss (Fl. Phan. Ant. Fr. 563. 1897) noted that *D. stricta* Sims, *D. indivisa* Forster and *D. guilfoylei* Veitch were in cultivation at the Botanic Garden of St. Pierre, Martinique, and that several species had spread into the countryside. No specimens have been seen to support these records. Fournet (Fl. Guadeloupe Martinique 239. 1978) referred *D. stricta* to *Cordyline stricta* Endl., *D. indivisa* Hort. to *Cordyline australis* Hook., and *D. guilfoylei* to *Cordyline fruticosa* (L.) A. Chev.

FURCRAEA Ventenat

Furcraea Vent. in Bull. Soc. Philom. Paris 1: 28, 65. 1793. FIGURE 111.

Large rosette-forming herbs, caudex short. Leaves large, thick, commonly ridged, spine-tipped, margins smooth or prickly. Inflorescence stout, paniculate, axis with broad triangular bracts. Flowers clustered; perianth funnel-form, the six segments spreading, white or greenish-white; stamens shorter than the perianth, borne on the base of the tepals, the filaments with swelling at the base; ovary inferior, 3-celled with ovules numerous, the style angled and thickened below, the stigma capitate. Generally reproducing by bulbils formed in the inflorescence. Capsule oblong, 3-angled; seeds numerous, flat.

LECTOTYPE SPECIES: *Furcraea cubensis* (Jacq.) Vent., based on *Agave cubensis* Jacq., 1763, now correctly known as *Furcraea hexapetala* (Jacq.) Urb., based on *Agave hexapetala* Jacq., 1760.



FIGURE 110. Agavaceae. *Dracaena fragrans*, $\times 0.2$.

A tropical American genus of 20 species. See also: J. H. Drummond, The literature of *Furcraea* with a synopsis of the known species, in Missouri Bot. Gard. Rep. 18: 25-75. 1907.

OBSERVATIONS: Alternate spellings of the generic name occurring in the literature are: *Furcroea* Vent. (1793), *Furcroya* Raf. (1814), *Fourcroya* Spreng. (1817) and *Fourcroea* Haw. (1819).

The following treatment is very unsatisfactory, since the key characters used to separate "species" do not work for the few herbarium specimens annotated by previous scholars. The characters used were suggested by Drummond and repeated by subsequent workers.

KEY TO THE SPECIES

1. Leaves broadly oblong-lanceolate, 1.25-1.50 m. long, 13-18 cm. broad, juice not foetid; plants very bulbiferous, the bulbils elongate. *F. tuberosa*
- 1a. Leaves long obovate-oblong, 1.5-2.5 m. long, 18-25 cm. wide, the juice foetid; plants scarcely bulbiferous, the bulbils short. *F. foetida*

Furcraea foetida (L.) Haw., Syn. Pl. Succ. 73. 1812.

Basionym: *Agave foetida* L., Sp. Pl. 1: 323. 1753.

Type: Curaçao, Plukenet, Alm. t. 258, f. 2. 1700.

Syn.: *Furcraea gigantea* Vent. in Bull. Soc. Philom. Paris 1: 65. 1793; Fournet, Fl. Guadeloupe Martinique 242. 1978.

Rosette plant. Leaves obovate-lanceolate, 1.5-2.5 m. long, 18-25 cm. wide. Plant scarcely bulbiferous, the bulbils short.

GENERAL DISTRIBUTION: Central America, Greater and Lesser Antilles, Trinidad, South America.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe, Martinique.

OBSERVATIONS: This species is reported by Drummond from Guadeloupe on the basis of the collections *Hahn 1122* and *Duss 3602* and from Martinique on the basis of *Duss 2125*, although he did not see either Duss collection. Fournet (Fl. Guadeloupe Martinique 242. 1978) stated for *F. gigantea*, "Espèce confondue par Duss avec la précédente, ou négligée. Originaire du Brésil. Naturalisé. Xérophile, littoral."

Furcraea tuberosa (Mill.) Ait. f. in Ait., Hort. Kew. ed. 2. 2: 303. 1811.

Basionym: *Agave tuberosa* Mill., Gard. Dict. ed. 8. *Agave* no. 4. 1768.

Type: Plukenet, Alm. 19. 1700.

Rosette plants. Leaves broadly oblong-lanceolate, 1.2 m. long or more, 13-18 cm. broad at the middle, the marginal prickles 2-4 mm. long, straight or curved. Panicle to 7 m. tall, the upper half loosely paniculate, the branches loose and often drooping. Flowers with perianth greenish-white, tepals 2.4-2.7 cm. long, 1-2 cm. broad, the inner slightly broader than the

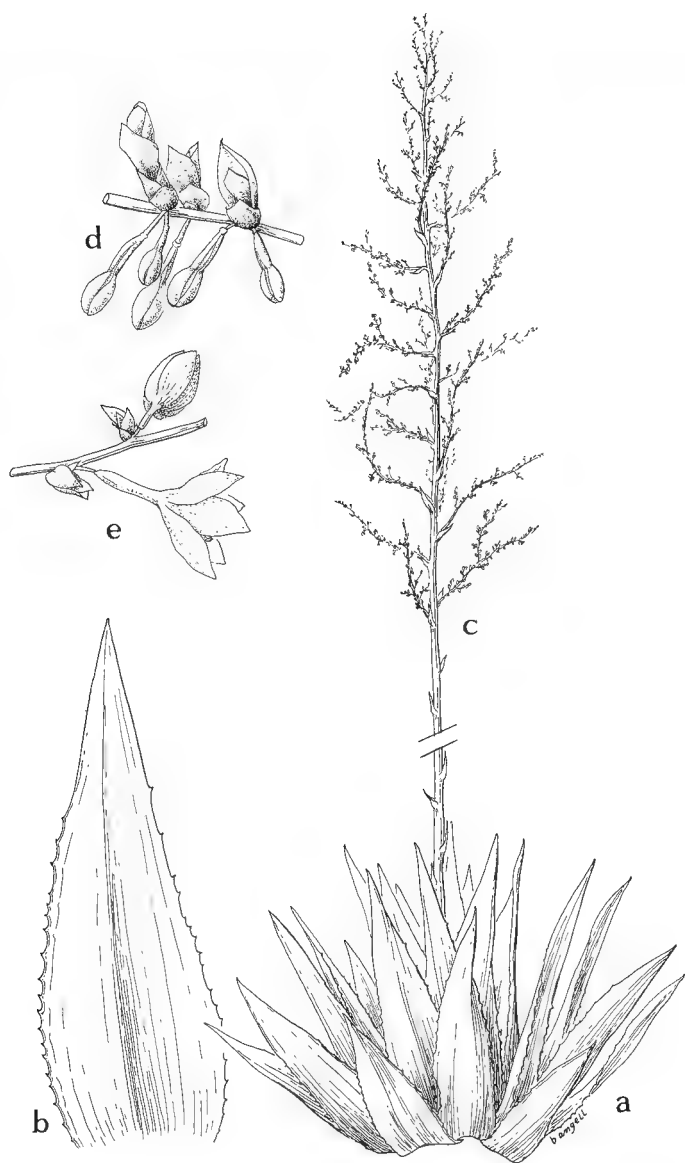


FIGURE 111. Agavaceae. a-e, *Furcraea tuberosa*: a, habit of basal rosette, $\times 0.05$; b, leaf, $\times 0.06$; c, habit of inflorescence, $\times 0.02$; d, portion of flowering branch showing erect bulbils and pendent flower buds, $\times 0.3$; e, portion of flowering branch with open flower, $\times 0.3$.

outer; stamens much shorter than the perianth. Capsule unknown; bulbils numerous in the inflorescence immediately after flowering.

GENERAL DISTRIBUTION: Endemic to the Lesser Antilles.

DISTRIBUTION IN LESSER ANTILLES: St. Barts!, Antigua!, Saba!, St. Eustatius, St. Kitts!, Nevis, Montserrat, Guadeloupe, Marie Galante, Dominica!, Martinique, St. Lucia!, St. Vincent, the Grenadines, Grenada!, Barbados!.

SANSEVIERIA Thunberg

Sansevieria Thunberg, Prodr. Pl. Cap. 5: 65. 1794, nom. cons.

FIGURE 112.

Stemless plants with creeping rhizomes. Leaves often in a rosette, fleshy or coriaceous, terete or flattened, rigid and erect. Inflorescence racemose; pedicels articulated, solitary or fascicled. Flowers with perianth tubular at base, the lobes spreading or recurved; stamens 6, exerted, the filaments slender, filiform; ovary 3-celled, with one ovule in each cell, the style slender, filiform. Fruit a berry with 1-3 bony seeds.

LECTOTYPE SPECIES: *Sansevieria hyacinthoides* (L.) Druce, based on *Aloe hyacinthoides* L. *β guineensis* L. (Sp. Pl. 1: 321. 1753).

A genus of 60 species found in tropical climates and South Africa, Madagascar, and Arabia. See also N. E. Brown, *Sansevieria*, in Kew Bull. 1915: 185-261. 1915; D. O. Wijnands, Typification and nomenclature of two species of *Sansevieria* (Agavaceae), in Taxon 22: 109-114. 1973; W. Marais, Proposal to amend the entry of 1100 *Sansevieria* in the list of *Nomina Generica Conservanda*, in Taxon 22: 158, 159. 1973; Report of Committee for Spermatophyta, Taxon 23: 823, 824. 1974.

OBSERVATIONS: The correct nomenclature for the populations of *Sansevieria* in the Lesser Antilles is only partially resolved by the following treatment. In recent years none of the local Caribbean floras has applied the same names to common populations, and it is possible that additional species or hybrids are involved. *Sansevieria* is well established in sandy beach locations, near cemeteries, on limestone outcrops in coastal areas, and in thorn scrub formations which now dominate formerly cultivated fields. Although it was once cultivated for fiber, such use is now infrequent.

Duss (Fl. Phan. Ant. Fr. 564. 1897) reported *Sansevieria zeylanica* under cultivation and commented on the strong and exquisite odor; no specimens were cited. Fournet (Fl. Guadeloupe Martinique 231. 1978) refers this name to the synonymy of *S. trifasciata*, a species less aromatic in flower than *S. hyacinthoides* (*S. guineensis* auct.) which now appears to be properly named. As interpreted by the author, true *Sansevieria zeylanica* (L.) Willd. has not been seen in the Lesser Antilles.

Cultivated plants with longitudinally yellow-striped leaves have been reported as *S. trifasciata* cv. *Laurentii* and *S. laurentii* De Wild. The smaller

rosette forms known as *S. trifasciata* cv. *Hahnii* or "*S. hahnii* Hort." have been seen in cultivation as pot plants and in outdoor rock and wall gardens, with no evidence of spontaneous escapes.

Sansevieria was not reported by Grisebach (1864) and probably represents an introduction which has become naturalized within the last century.

KEY TO THE SPECIES

- 1. Leaves cylindrical. *S. cylindrica*
- 1a. Leaves flat. 2
- 2. Margins of leaves red-brown. *S. hyacinthoides*
- 2a. Margins of leaves green or white. *S. trifasciata*

Sansevieria cylindrica Bojer ex Hook. in Curtis Bot. Mag. 85: t. 5093. 1859.

Type: Described from a living plant represented by Curtis Bot. Mag. t. 5093.

Stemless plants with stout rhizomes. Leaves 3 or 4, two-ranked, stiffly erect, 60–120 cm. long, cylindric or slightly compressed, tapering to a rigid whitish point. Inflorescence to 1 m. long. Flowers 5 or 6 in a cluster; perianth white or tinted pink, the lobes 2–3 cm. long, linear, revolute. Fruit orange.

GENERAL DISTRIBUTION: Native of Mauritius, widely cultivated and persisting.

DISTRIBUTION IN LESSER ANTILLES: St. Martin!, Antigua!, Montserrat!, Guadeloupe, Martinique.

Sansevieria hyacinthoides (L.) Druce in Rep. Bot. Exch. Cl. British Isles 1913, 3: 423. 1914.

Basionym: *Aloe hyacinthoides* L. *β guineensis* L., Sp. Pl. 1: 321. 1753.

Type: C. Commelin, Praeludia Botanica 84, t. 33. 1703.

Syn.: *Sansevieria guineensis* (L.) Willd., Sp. Pl. 2: 159. 1799.

Sanseverinia thyrsiflora Petagna, Inst. Bot. 3: 643. 1787, nom. illeg.

Sansevieria thyrsiflora Thunb., Prodr. Pl. Cap. 65. 1794, nom. illeg.

Sansevieria metallica Gérôme & Labroy in Bull. Mus. Hist. Nat. Paris 2: 170, 173, fig. 2. 1903; Gooding *et al.*, Fl. Barbados 102. 1965; Fournet, Fl. Guadeloupe Martinique 231. 1978.

Stemless plants with stout rhizomes. Leaves 2–4, erect, lanceolate, 30–100 cm. long, 3–9 cm. broad at middle, the apex acute or obtuse, the blade dull green but marked with numerous but obscure transverse pale green bands, the margins brownish-red. Inflorescence 30–70 cm. long, bracteate; pedicels short, to 5 mm. long. Flowers with perianth lobes greenish-white, to 1.5 cm. long, revolute. Fruit red-orange.

GENERAL DISTRIBUTION: Native of South Africa, widely cultivated and commonly escaping and persisting.



FIGURE 112. Agavaceae. *Sansevieria hyacinthoides*, $\times 0.6$.

DISTRIBUTION IN LESSER ANTILLES: St. Martin!, St. Barts!, Antigua!, Guadeloupe!, Martinique, St. Vincent!.

COMMON NAMES: Snake plant, bowstring, z'oreille à bourrique, langue à chat, sanddragon de cermitière (cimetière).

Sansevieria trifasciata Prain, Bengal Plants 2: 1054. 1903.

Type: Cultivated plant, represented by Jacquin, Hort. Vind. t. 308. 1762.

Stemless plants with stout rhizomes. Leaves 1 or 2, linear-lanceolate, 30-100 cm. long, 3-5 cm. wide, erect, stiff, the apex tapering to stout green point, the blades transversely banded on both sides with contrasting green and clear to white areas, the margins green. Inflorescence 30-75 cm. long. Flowers solitary or in clusters of 2 or 3, bracteate; pedicels to 5 mm. long; perianth tube to 1 cm. long, the lobes to 2 cm. long, white or greenish-white. Fruit a bright orange berry.

GENERAL DISTRIBUTION: Native of Africa, cultivated and persisting.

DISTRIBUTION IN LESSER ANTILLES: St. Martin, Saba, St. Eustatius, Guadeloupe, Martinique, St. Lucia!, St. Vincent!.

COMMON NAMES: Rhamni, Yerba ci cinta, yerba di colebas, snake plant, oreillo di burian.

YUCCA Linnaeus

Yucca L., Sp. Pl. 1: 319. 1753.

FIGURE 113.

Stout, coarse plants with woody caudex or simple or branched stems. Leaves spiral, crowded at the apex, thick, rigid, spinose at the apex, the margin entire, denticulate or filiferous. Flowers in large terminal panicles, pedicellate, commonly pendent; perianth segments lance-ovate, distinct, often fleshy; stamens 6, the filaments stout; ovary sessile or shortly stalked, 3-locular, with numerous ovules. Fruit capsular, fleshy or chartaceous; seeds black, compressed.

TYPE SPECIES: *Yucca aloifolia* L.

A New World genus of 40 species found in the southern United States, Mexico and the West Indies.

Yucca aloifolia L., Sp. Pl. 1: 319. 1753.

Type locality: Jamaica.

Simple plants 1-2 m. tall to branched colonies 10 m. tall. Leaves numerous in tight spirals, narrowly linear, 35-60 cm. long, 2.5-3.5 cm. wide, the apical spine terete, 1 cm. long, black, the margins entire to denticulate. Inflorescence terminal, paniculate, 20-70 cm. long. Flowers with tepals white, fleshy, 4-6 cm. long. Fruit not seen in the Lesser Antilles but reported to be oblong, 5-9 cm. long, 2.5-4.0 cm. in diameter, without a papery core but with purple pulp; seeds black.



FIGURE 113. Agavaceae. a, b, *Yucca aloifolia*: a, habit, $\times 0.05$; b, flowers, $\times 0.3$.

GENERAL DISTRIBUTION: Mexico, Central America, Florida, Greater Antilles.

DISTRIBUTION IN LESSER ANTILLES: St. Martin!, St. Barts!, Antigua!, Guadeloupe, St. Lucia!.

COMMON NAMES: Adam's needle, yucca.

DOUBTFUL AND CULTIVATED SPECIES

Yucca guatemalensis Baker (*Y. elephantipes* Regel, nom. illeg.) has been reported in cultivation. The ovary is reported as sessile, the fruit as having a papery core, and the pulp as greenish or white; however, *Yucca* does not bear fruit in the Lesser Antilles. The name is applied to young plants with leaves 60-75 cm. long attaining 5 cm. at the greatest width.

Yucca gloriosa L. was reported by Fournet (Fl. Guadeloupe Martinique 227. 1978) from Guadeloupe. This species has never been adequately described, and the name is used only in horticultural literature.

Yucca filamentosa L. and *Yucca flaccida* Haw., also reported under cultivation by Fournet (Fl. Guadeloupe Martinique 227. 1978), are not so represented in herbaria.

SPECIES IN CULTIVATION

Polianthes tuberosa L., the tuberose, is found in cultivation on Saba, St. Kitts and St. Lucia.

DIOSCOREACEAE

DIOSCOREACEAE R. Brown, Prodr. 294. 1810.

Herbaceous or woody vines arising from thick, tuberous, subterranean bases which are entire or branched or lobed; stems terete or winged, often conspicuously twisted, armed with terete or flattened prickles or acicular nodal spines or unarmed. Leaves alternate or opposite, petiolate, the blades usually cordate and entire, occasionally lobed or divided, pellucid dots or lines common, the venation strongly palmate and curved. Plants dioecious; inflorescences axillary, solitary or clustered, spicate, racemose or paniculate. Flowers small, regular; perianth biseriate or 6-lobed; staminate flowers with epitepalous stamens, 6 fertile or 3 fertile with staminodes present or wanting, the filaments short, free or slightly connate, the pistillode present or absent; pistillate flowers often with staminodes, the ovary inferior, linear or oblong, 3-locular, with ovules generally 2 in each locule, the styles 3, free or united. Fruit a 3-valved dehiscent capsule commonly with 3 wings, or an indehiscent samaroid fruit; seeds variously winged or wingless.

TYPE GENUS: *Dioscorea* Linnaeus.

A tropical and warm-temperate family of about 750 species classified in five genera. For a complete treatment of the family, see R. Knuth, *Dioscoreaceae*, in *Das Pflanzenr.* IV, 43: 1-387. 1924.

KEY TO THE GENERA

1. Fruit a 3-celled, 3-winged or 3-angled dehiscent capsule. *Dioscorea*
1a. Fruit a 1-seeded, indehiscent samara. *Rajania*

DIOSCOREA Linnaeus

Dioscorea L., *Sp. Pl.* 2: 1032. 1753.

FIGURE 114.

Twining herbaceous or woody vines with large tubers. Tubers single or clustered, ovoid, elongate, variously flattened or lobed, edible or inedible. Stems terete, winged or angled, smooth or armed with flattened, or terete and straight or curved prickles. Leaves alternate or opposite, often bearing large or small bulbils in the axils, petiolate; blades usually cordate with arching parallel veins or palmately lobed. Plants dioecious; staminate flowers in axillary spikes, racemes or panicles, perianth small, stamens 6, all fertile or 3 fertile and 3 staminodes; pistillate flowers with inferior ovary, persistent small perianth, and staminodes. Fruit a deciduous capsule, usually three-winged, chartaceous or leathery; seeds flat with a membranous wing.

TYPE SPECIES: *Dioscorea sativa* L. according to Britton & Wilson. The name, however, is invalid according to Coursey and Prain & Burkill.

A genus of about 600 tropical and subtropical species. See also D. Prain & I. H. Burkill, *Dioscorea sativa*, in *Kew Bull.* 1919: 339-375; D. G. Coursey, *Yams. An account of the nature, origins, cultivation and utilisation of the useful members of the Dioscoreaceae.* 230 pp. Longmans, London. 1967.

OBSERVATIONS: The majority of the species of *Dioscorea* encountered in the Lesser Antilles are introduced and cultivated food plants. A few persist after cultivation or have escaped; only a few species are truly native, and these may be considered inedible by the local people. In most cases, herbarium specimens are few, inadequate, and poorly prepared or preserved. Many cultivated yams flower infrequently if at all, or are harvested before the plants reach flowering age. The species are dioecious, as far as is known, and the herbarium specimens are generally either staminate flowering specimens or specimens collected in fruit.

The last available monography by Knuth in 1924 is a far from satisfactory treatment. The characterizations of the West Indian taxa are uneven and not comparable. Characteristics which seem valid in print are not to be found in available specimens. Typification of the species described by Linnaeus and Lamarck is difficult and remains a job for a specialist. The descriptions given in the following treatment are limited to a compilation of the most apparent and useful characters for the determination of herbarium specimens.

KEY TO THE SPECIES

1. Leaf blades 3-5-lobed; leaves alternate; stems 4-angled or -winged; perfect stamens 6. *D. trifida*
- 1a. Leaf blades entire. 2
2. Leaves pilose on the lower surface. 3
- 2a. Leaves glabrous. 5
3. Stems with 2 curved acicular spines at the nodes. *D. esculenta*
- 3a. Stems unarmed. 4
4. Leaves ovate to ovate-oblong, the base rounded or cordate. *D. pilosiuscula*
- 4a. Leaves cordate-lanceolate, the base auriculate. *D. duchassaingii*
5. Leaves opposite. 6
- 5a. Leaves alternate. 7
6. Stems conspicuously winged, prickles wanting; leaf blade sinus deep and narrow. *D. alata*
- 6a. Stems not winged, commonly armed with short prickles; leaf blade sinus shallow and broad. *D. cayenensis*
7. Stems sharply angled, armed with large, flat, brownish prickles. *D. altissima*
- 7a. Stems without wings or angles and unarmed. 8
8. Plants usually with large, brown, axillary bulbils; fertile stamens 6. *D. bulbifera*
- 8a. Plants without axillary bulbils; fertile stamens 3. *D. polygonoides*

Dioscorea alata L., Sp. Pl. 2: 1033. 1753.

Type: LINN 1184.2.

Glabrous herbaceous vine; stems 4-angled or 4-winged, often brightly colored. Leaves opposite; petioles 5-14 cm. long, often winged; blades hastate-ovate to broadly ovate or suborbicular, 5-9-nerved, 7-20 cm. long, 4-12 cm. broad, the apex abruptly acuminate with acumen 1.5-2.5 cm. long, the basal lobes oblong, rounded, the sinus narrow and deep. Staminate inflorescence of whorled, panicle, flexuous spikelets; pistillate inflorescences simple spikes. Capsule broader than long, 2.2-3.0 cm. in diameter.

GENERAL DISTRIBUTION: Native of Southeast Asia and cultivated throughout the tropics.

DISTRIBUTION IN LESSER ANTILLES: St. Barts, Antigua!, Barbuda, Saba!, St. Eustatius, St. Kitts, Montserrat, Guadeloupe!, Marie Galante, Dominica!, Martinique!, St. Lucia!, Grenada!.

OBSERVATIONS: H. J. Gooding ("West Indian '*Dioscorea alata*' cultivars," in Trop. Agric. (Trin.) 37: 15-30. 1960) recognized and named about thirty cultivars. F. W. Martin and A. M. Rhodes ("Intraspecific classification of *Dioscorea alata*," in Trop. Agric. (Trin.) 54: 1-14. 1977) examined over 100 introductions and noted that "sexual reproduction is almost unknown," that flowering was sporadic and that the flowers were invariably sterile.

Dioscorea altissima Lam., Encycl. Méth. Bot. 3: 231. 1789.

Type: Not designated; probably Burman, Ic. t. 117, f. 2. 1755.

Syn.: *Dioscorea multiflora* Presl, Bot. Bemerk. 116. 1844, non Martius; Griseb., Fl. Br. W. Ind. Isl. 588. 1864. (Type: Not indicated.)

Stout subwoody vine, with brownish, sharply angled, more or less winged stems armed with large flat prickles. Leaves alternate; petioles 5.0-7.5 cm. long, occasionally armed with prickles; blades ovate to orbicular, 7-11-nerved, 8-15 cm. long, 7-16 cm. wide, apex acuminate, base cordate. Staminate spikes simple; pistillate spikes simple but usually aggregated. Capsule to 3 cm. long, 1.5 cm. wide.

GENERAL DISTRIBUTION: Lesser Antilles, Brazil.

DISTRIBUTION IN LESSER ANTILLES: St. Martin, St. Barts, Guadeloupe!, Martinique, St. Vincent!.

COMMON NAMES: Igname grand bois, igname marron.

***Dioscorea bulbifera* L., Sp. Pl. 2: 1033. 1753.**

Type: Not determined.

Syn.: *Dioscorea lutea* sensu Griseb., Fl. Br. W. Ind. Isl. 588. 1864, in part.

Herbaceous vine with glabrous stems commonly bearing large, brown, verrucose bulbils in leaf axils, these globose or irregular, to 15 cm. in diameter. Leaves alternate, petioles 6-14 cm. long, blades broadly ovate, 15-25 cm. long, 7-20 cm. wide, apex acuminate or cuspidate, basal lobes rounded, sinus deep and narrow, veins 9. Staminate spikes fasciculate, 3-10 cm. long; pistillate spikes simple, solitary, 10-15 cm. long. Capsule oblong, 2.5 cm. long, 1.5 cm. wide.

GENERAL DISTRIBUTION: Native of the Old World tropics, commonly escaped in southeastern United States and tropical America.

DISTRIBUTION IN LESSER ANTILLES: Antigua, St. Kitts!, Guadeloupe, Martinique!, St. Vincent!.

***Dioscorea cayenensis* Lam., Encycl. Méth. Bot. 3: 233. 1789.**

Type: Cayenne, *Stoupy ex Lam.*

Syn.: *Dioscorea berteriana* Kunth, Enum. Pl. 5: 381. 1850. (Type: Guadeloupe, *Bertero* (n.v.).)

Dioscorea occidentalis Knuth, Das Pflanzenr. IV, 43: 299. 1924, nom. nov. for *Dioscorea cayennensis* var. *rotundata* Griseb., Fl. Br. W. Ind. Isl. 587. 1864, non Poir. (Type: Jamaica, *March.*)

Glabrous vine, stems terete or nearly so, armed below with small sharp prickles. Leaves mostly opposite; petioles 4.5-9.0 cm. long; blades ovate to oblong in outline, 7-veined, 6-14 cm. long, 5-10 cm. wide, punctate with elongate, pellucid lines, apex abruptly long-acuminate, base cordate-hastate, the sinus broad and shallow. Staminate inflorescences spicate and

clustered or stalked and paniculate, with 6 fertile stamens; pistillate inflorescences simple spikes. Capsule elliptic-oblong, 1.7 cm. long.

GENERAL DISTRIBUTION: Origin uncertain; commonly cultivated throughout the tropics, especially in the New World.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe!, Dominica!, St. Lucia!, St. Vincent!, Grenada!.

COMMON NAMES: Yam jeune la fêvre, igname carême, igname jaune grosse tête.

OBSERVATIONS: Adams (Fl. Pl. Jamaica 66. 1972) recognizes *D. cayensis* as the "yellow yam" with "flesh of tuber usually yellow, with starch grains small and roughly triangular; stock woody and cormous above the tubers; tubers of short dormancy with shoot production almost continuous." He also accepts *D. rotundata* as the "white yam" with "flesh of tuber usually white, with starch grains large and ovoid; stock not markedly woody; tubers of definite long dormancy with shoot production strongly seasonal." I have found no method of distinguishing these species on the basis of herbarium specimens.

Dioscorea duchassaingii Knuth, Das Pflanzenr. IV, 43: 67. 1924.

Type: Guadeloupe, *Duchassaing* (B, lost?).

Vine with terete stems. Leaves alternate; petioles 3-5 cm. long; blades cordate-lanceolate, 5-9 cm. long, 4-5 cm. wide, 7-veined, apex acute, apiculum 1 mm. long, basal lobes rounded, the sinus broad.

GENERAL DISTRIBUTION: Reported only from the Lesser Antilles.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe!, Martinique!, St. Vincent!.

OBSERVATIONS: In the brief original description, Knuth related this taxon to *D. pilosiuscula* and *D. sapindoides* and described only the three-angled leaves. The collection *Belanger 608* (P) made in 1857 in Martinique appears to represent this species. All collections now assigned to this taxon are sterile, and descriptions of the inflorescences, flowers and fruits are still needed.

Dioscorea esculenta (Lour.) Burkill in Gard. Bull. Straits Settl. 1: 396. 1917.

Basionym: *Oncus esculentus* Lour., Fl. Cochinch. 194. 1790.

Type: "Habitat in sylvis cochinchinae," *Loureiro* (BM).

Syn.: *Dioscorea esculenta* var. *fulvido-tomentosa* Knuth, Das Pflanzenr. IV, 43: 190. 1924. (Type: Not selected.)

Herbaceous vine, stems commonly ferruginous-villose, armed with curved spines at the nodes. Leaves alternate; petioles 5-8 cm. long; blades

broadly cordate, pubescent below, 7-8 cm. long, 9-10 cm. broad, apex short-acuminate, base cordate, the sinus deep and narrow.

GENERAL DISTRIBUTION: Native of tropical Asia, cultivated elsewhere.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe, Martinique.

OBSERVATIONS: This species was listed by Stehlé (Bull. Soc. Bot. France 123: 447. 1976) and also by Fournet (Fl. Guadeloupe Martinique 249. 1978) as cultivated and known as "cousse-couche douce, or igname pas possible." No West Indian specimens have been seen.

Dioscorea pilosiuscula Bertero ex Spreng. in L., Syst. Veg. ed. 16. 2: 152. 1825.

Type: Hispaniola, *Bertero*.

Slender herbaceous vine with stems subcylindrical, glabrous or sparingly pilose at the nodes, occasionally bearing bulbils in leaf axils. Leaves alternate; petioles 2-5 cm. long; blades ovate to ovate-oblong, 8-14 cm. long, 4-7 cm. wide, 5-7-nerved, apex abruptly acuminate, base shallowly cordate to subtruncate, the sinus broad. Staminate inflorescences spicate, 1-4 per axil, 15-30 cm. long; pistillate inflorescences spicate, to 28 cm. long, the rachis, bracts and ovaries pilose. Capsule oblong-elliptic, 2.5 cm. long, 1 cm. broad.

GENERAL DISTRIBUTION: Greater Antilles, South America.

DISTRIBUTION IN LESSER ANTILLES: Antigua!, Guadeloupe!, Dominica!, Martinique!, St. Vincent!, Grenada, Barbados.

COMMON NAMES: Igname bâtard, igname coc-bourrique, igname porte-en-l'air.

Dioscorea polygonoides Humboldt & Bonpland ex Willd., Sp. Pl. 4: 795. 1805.

Type: Rio Orinoco, *Humboldt & Bonpland ex Herb. Willd.*

Syn.: *Dioscorea polygonoides* var. *sieberi* (Kunth) Uline ex Knuth, Das Pflanzenr. IV, 43: 217. 1924. Basionym: *D. sieberi* Kunth in Abh. Königl. Akad. Wiss. Berlin. 58. 1808. (Type: Martinique, *Sieber s.n.*)

Dioscorea polygonoides var. *martinicensis* (Spreng.) Knuth, Das Pflanzenr. IV, 43: 217. 1924. Basionym: *D. martinicensis* Spreng., Neue Entdeck. 3: 17. 1822. (Type: *Sieber s.n.*, Martinique.)

Dioscorea polygonoides var. *scorpioidea* Uline ex Knuth in Notizbl. Bot. Gard. Berlin 7: 208. 1917. (Type: Syntypes cited.)

Dioscorea polygonoides var. *cabreana* Stehlé in Bull. Soc. Bot. France 123: 447. 1976, nom. illeg.

Herbaceous vine; stems subterete, glabrous. Leaves alternate; petioles 5-8 cm. long; blades ovate to ovate-oval, 8-21 cm. long, 5-17 cm. wide,

apex long-acuminate, base deeply cordate, sinus rounded or the margins acute. Staminate inflorescence spicate, the spikes single, clustered or sparingly branched, to 25 cm. long, the flowers in few to many clusters; pistillate inflorescence a simple or branched raceme. Capsule oblong-oval to broadly oval, 2.5-3.0 cm. long, 2.0-2.7 mm. broad, chartaceous.

GENERAL DISTRIBUTION: Mexico, Central America, Jamaica, Hispaniola, Puerto Rico, South America.

DISTRIBUTION IN LESSER ANTILLES: Antigua!, Montserrat!, Guadeloupe!, Dominica!, Martinique!, St. Lucia!, St. Vincent!, Grenada!

COMMON NAMES: Yami marron, igname sauvage, igname-bois, yam pule.

OBSERVATIONS: This is the most common wild yam of the Lesser Antilles. The light, slender stems reach high into forest canopies and often cascade downward in open areas. The herbarium specimens available seem to represent populations characterized by the amount of branching of the staminate inflorescence, the number of staminate flowers per cluster, the large size of leaves and the narrow form of the fruit. It is impossible with the material currently available to correlate the differences observed with the varieties recognized by Knuth. The largest leaves are found consistently in specimens from Martinique and St. Lucia. Subscorpioid branches of staminate inflorescences are most common in specimens from St. Vincent. Distinctly smaller fruits are found in specimens from St. Vincent and Grenada.

Dioscorea trifida L. f., Suppl. Pl. 427. 1781.

Type: "Habitat in Surinamo."

Syn.: *Dioscorea triloba* Lam., Encycl. Méth. Bot. 3: 234. 1789. (Type: *Herb. Jusieu.*)

Dioscorea tuberosa sensu Duss, Fl. Phan. Ant. Fr. 566. 1897.

Dioscorea trifida var. *tuberosa* (Well.) Stehlé in Bull. Soc. Bot. France 123: 447. 1976, illeg.

Herbaceous vine, the stems 4-angled, striate or slightly winged, unarmed. Leaves alternate; petioles 5-12 cm. long; blades ovate in outline, 15-20 cm. long, 15-25 cm. wide, 3-5-lobed, 9-11-veined, the lobes ovate-lanceolate, acuminate at the apex, outer basal lobes commonly rounded, the sinus broad and shallow, the under surface short-pilose-pubescent. Staminate flowers in long, slender, paniced spikes with branches sometimes whorled; pistillate flowers in simple racemes to 50 cm. long, ovary pilose. Capsule oblong-elliptic, 2.5-3.4 cm. long, 1.5 cm. broad, coriaceous.

GENERAL DISTRIBUTION: Greater Antilles, South America.

DISTRIBUTION IN LESSER ANTILLES: St. Martin, St. Barts, Saba, Guadeloupe!, Martinique!, St. Lucia!, St. Vincent!.

COMMON NAMES: Igname cousse-couche, cush-cush yam, igname bonda.



FIGURE 114. Dioscoreaceae. a, *Dioscorea polygonoides*, habit showing fruit, $\times 0.5$. b-e, *Rajania cordata*: b, leaf and cluster of fruits, $\times 0.5$; c, leaf and inflorescence with pistillate flowers, $\times 0.5$; d, leaf and staminate inflorescence, $\times 0.5$, insert showing staminate flowers, $\times 2$.

RAJANIA Linnaeus

Rajania L., Sp. Pl. 2: 1032. 1753.

FIGURE 114.

Twining herbaceous vines from an elongated, deep-rooted tuber; stems terete. Leaves alternate, petiolate; blades entire. Plants dioecious, inflorescences axillary, racemose. Staminate flowers generally borne on scorpioid or cymose branches of an elongated raceme; perianth 6-parted; stamens 6, the filaments short; pistillate rudiment present or wanting. Pistillate flowers with 6 distinct tepals; staminodia minute or wanting; styles 2-cleft. Fruit a 1-seeded, indehiscent samara, the single wing developing laterally and appearing to be terminal.

TYPE SPECIES: *Rajania hastata* Linnaeus.

A West Indian genus of 25 species.

Rajania cordata L., Sp. Pl. 2: 1032. 1753.

Type: Plumier, Gen. 33. "Habitat in America meridionalis."

Syn.: *Rajania pleioneura* Griseb., Fl. Br. W. Ind. Isl. 588. 1864. (Type: Dominica, Imray s.n.)

Herbaceous vine often exceeding 10 m. in length; stems glabrous. Leaves alternate; petioles 1-5 cm. long; blades oblong- to triangular-ovate or broadly ovate, 4-20 cm. long, 2-12 cm. wide, 7-9-veined, apex acute to long-acuminate, base cordate to subrounded, sparsely pilose. Staminate inflorescence 6-35 cm. long, pilose; pistillate inflorescence racemose, 7-30 cm. long, the rachis and flowers sparsely pilose. Samara wing narrow to broadly obovate-oblong, 1.0-2.5 cm. long, lustrous.

GENERAL DISTRIBUTION: Jamaica, Hispaniola, Puerto Rico, Trinidad.

DISTRIBUTION IN LESSER ANTILLES: Antigua, St. Kitts, Montserrat, Guadeloupe!, Dominica!, Martinique!, St. Vincent.

COMMON NAMES: Wa-wa, igrname ouaoua, igrname-bamboche bâlard.

IRIDACEAE

IRIDACEAE A. L. Jussieu, Gen. 57. 1789.

Perennial plants from rhizomes, bulbs or corms. Leaves equitant. Inflorescences axillary, scapose, racemose, or cymose. Flowers perfect, regular or irregular, solitary or in clusters from spathe-like bracts; perianth of 6 segments, commonly fused at the base, fugacious and persistent; stamens 3, inserted on the perianth opposite the outer lobes, the filaments distinct or partially united; ovary inferior, 3-celled, with numerous ovules, the styles distinct, entire or divided, sometimes flattened and petal-like. Capsule loculicidally 3-valved; seeds spherical or flattened or angled.

TYPE GENUS: *Iris* Linnaeus.

This family is comprised of 60 genera and about 800 species found throughout the world in temperate and tropical areas. The chief centers of distribution are South Africa and tropical America.

KEY TO THE GENERA

1. Caulescent herbs with short, stout rootstocks; flowers orange-yellow with purple spots; capsule valves deciduous, seeds shiny, black, adhering to column. *Belamcanda*
- 1a. Acaulescent herbs from bulbs or corms. 2
2. Leaves flat; plants from corms; flowers yellow; capsules exserted on elongated pedicels. *Trimezia*
- 2a. Leaves plicate; plants bulbous; flowers white; capsules included in spatheous bract. *Eleutherine*

BELAMCANDA Adanson

Belamcanda Adans., Fam. Pl. 2: 60, 564. 1763, nom. cons. FIGURE 115.

Perennial, caulescent herbs from short, stout rhizomes. Leaves equitant, broadly linear. Flowers in branched, terminal, bracteate clusters; perianth tube short, segments mottled; stamens 3, filaments distinct, adnate to base of perianth segments; ovary 3-celled, the style slender, with flattened and emarginate branches. Capsule obovoid, loculicidally 3-valved, the valves recurved and deciduous, central column persistent with attached, globose, black and shiny seeds.

TYPE SPECIES: *Belamcanda chinensis* (L.) A. DC., based on *Ixia chinensis* L.

An East Asian genus of two species.

- **Belamcanda chinensis** (L.) A. DC. in Redoute, Lil. 3: t. 121. 1805.

Basionym: *Ixia chinensis* L., Sp. Pl. 1: 36. 1753.

Type: "India," Hort. Ups. 16 (LINN 58.34).

Syn.: *Belamcanda punctata* Moench., Meth. 529. 1794; Boldingh, Fl. Dutch W. Ind. Isl. 39. 1909. (A renaming of *Ixia chinensis*, and with the same type.)

Iris chinensis Vélaz, Herb. Angiosperms 97. 1957, sphalm.

Stems stout, 0.4–1.0 m. tall. Leaves nearly erect, equitant and folded, 15–50 cm. long. Inflorescence to 50 cm. long; bracts similar to leaves. Flowers several; perianth 3–5 cm. broad, the segments nearly alike, oblong, obtuse at apex, narrowed at base, orange-yellow mottled with crimson or purple spots. Capsule 2.0–2.5 cm. long; seeds black and shiny.

GENERAL DISTRIBUTION: Native of Asia, now widely cultivated, escaped and persisting.

DISTRIBUTION IN LESSER ANTILLES: Saba, St. Eustatius, St. Kitts!, Guadeloupe!, Martinique!.



FIGURE 115. Iridaceae. a, b, *Belamcanda chinensis*: a, stem and leaves, $\times 0.3$; b, portion of inflorescence, $\times 0.3$.

COMMON NAMES: Tiger flower, iris tigré.

OBSERVATIONS: Duss noted on an herbarium label that this plant was introduced by the Botanical Garden of St. Pierre and in 1886 had spread into the countryside of Martinique.

ELEUTHERINE Herbert

Eleutherine Herbert in Edw. Bot. Reg. 29: pl. 57. 1843, nom. cons.

FIGURE 116.

Acaulescent herbs from tunicated bulbs. Leaves few, lanceolate-acuminate, strongly plicate. Inflorescences on long scapes; spathes leaflike with several, stalked, often recurved, bracteate flower clusters. Flowers with perianth tube wanting, the segments subequal, spreading, obovate-cuneate; stamens attached at base of segments, the filaments short, free; ovary oblong, with many ovules, the style short, with 3, subulate, apically stigmatic branches. Capsule loculicidally 3-valved; seeds small, angled.

TYPE SPECIES: *Eleutherine bulbosa* (Mill.) Urban, based on *Sisyrinchium bulbosum* Miller.

A genus of four species, two found in Central and tropical South America and the West Indies, and two in Indochina.

Eleutherine bulbosa (Miller) Urban, Fedde Rep. Sp. Nov. 15: 305. 1918.

Basionym: *Sisyrinchium bulbosum* Miller, Gard. Dict. ed. 8. *Sisyrinchium* no. 3. 1768.

Type locality: West Indies.

Syn.: *Moraea plicata* Sw., Fl. Ind. Occ. 1: 82. 1797, illeg.

Eleutherine anomala Herb. in Edw. Bot. Reg. 29: pl. 57. 1843.

Eleutherine plicata (Sw.) Boldingh, Fl. Dutch W. Ind. Isl. 39. 1909.

Cipura plicata (Sw.) Griseb., Fl. Br. W. Ind. Isl. 589. 1864; Duss, Fl. Phan. Ant. Fr. 568. 1897.

Bulb ovoid, 3 cm. or more in diameter, tunica red-brown. Leaves 1 or 2, linear-lanceolate, 14–45 cm. long, 1–3 cm. wide. Scape to 35 cm. long; spathes oblong, 1.5 cm. long; bracted clusters of flowers slender, pedicelled; perianth white, 2.0–2.5 cm. broad, the segments obovate, spreading. Capsule globose, 1 cm. in diameter; seeds black.

GENERAL DISTRIBUTION: Central America, Greater Antilles, South America.

DISTRIBUTION IN LESSER ANTILLES: Antigua, St. Eustatius, Guadeloupe!, Dominica!, Martinique!, St. Vincent!, Grenada.

COMMON NAMES: Red root, chalotte caraibe, l'envers-femelle, chance, chalotte-bois, chalotte-savane.



FIGURE 116. Iridaceae. a, b, *Eleutherine bulbosa*: a, habit, $\times 1$; b, inflorescence, $\times 0.3$. c, d, *Trimezia martinicensis*: c, habit with fruit, $\times 0.3$; d, flower, $\times 0.3$.

TRIMEZIA Salisbury ex Herbert

Trimezia Salisb. ex Herb. in Edw. Bot. Reg. 30(misc.): 88. 1844.

FIGURE 116.

Herb with cormose base, tunicas splitting into coarse fibers. Leaves flat, broadly linear, the midrib prominent. Flowers stalked, more than one per spathe; perianth tube wanting, the segments in two dissimilar whorls, the outer obovate, with broad claw, the inner smaller, with deflexed blade; stamens short, erect, the filaments free; ovary clavate, the style subulate at base, branched, the three branches ending in small tubercles overtopping the small stigmas. Capsule oblong, exserted beyond the bracts.

TYPE SPECIES: *Trimezia meridensis* Herbert.

A genus of five species occurring from Mexico to tropical South America and the West Indies.

Trimezia martinicensis (Jacq.) Herb. in Edw. Bot. Reg. 30(misc.): 88. 1844.

Basionym: *Iris martinicensis* Jacq., Enum. 12. 1760; Select. 7, t. 7. 1763.

Type locality: Martinique; lectotype, Jacquin, Select. t. 7.

Syn.: *Cipura martinicensis* (Jacq.) Kunth in Griseb., Fl. Br. W. Ind. 589. 1864; Duss., Fl. Phan. Ant. Fr. 567. 1897.

Corm small, ovoid, to 1.5 cm. in diameter, with yellow-orange juice, tunica fibers dark brown. Leaves linear, to 30 cm. long and 1.5 cm. broad. Inflorescence 30 cm. long, simple or branched with linear bract at bifurcation; spathes long-peduncled, several-flowered; perianth yellow tinged with basal brown spot. Capsule oblong, 2 cm. long, on pedicel 2 cm. long, one-seeded; seed black, angled.

GENERAL DISTRIBUTION: Central America, Greater Antilles, South America.

DISTRIBUTION IN LESSER ANTILLES: Antigua!, Guadeloupe!, Dominica!, Martinique!, St. Lucia!, St. Vincent!, the Grenadines!, Grenada!.

COMMON NAMES: Coco shot, l'envers-mâle, l'envers jaune, jaune d'oeuf, lis jaune-savane, jambee-sieve.

SPECIES IN CULTIVATION

The following taxa are recorded as cultivated in the Lesser Antilles. In most cases, the names and associated islands have been taken from literature reports; however, an exclamation point (!) has been added where supporting herbarium material has been seen.

Crocus sativus Linnaeus—Guadeloupe, Martinique.

Crocasmia × *crocosmiiflora* (Lem. ex Morr.) N. E. Br. (syn.: *Montbretia crocosmiiflora* DC., *Tritonia crocosmiiflora* (Lem.) Nichols.)—Saba!, Guadeloupe!, Martinique.

Gladiolus hybrids—Guadeloupe, Martinique.

Iris kaempferi Sieber—Guadeloupe.

Neomarica caerulea (Ker-Gawler) Sprague—St. Lucia!

Neomarica longifolia (Link & Otto) Sprague—St. Lucia!

Tigridia pavonia (Linnaeus) DC.—Guadeloupe.

Tritonia pottsii Benth.—Recorded by Questel (Fl. Guadeloupe 171. 1951) from Guadeloupe; probably a misidentification of *Crocasmia* \times *crocasmiflora*.

MUSACEAE

MUSACEAE A. L. Jussieu, Gen. 61. 1789.

Stout perennial herbs with rhizomatous or cormose base, the pseudostem comprised of thick sheathing petioles of spirally arranged leaves. Leaf blades large, simple, oblong-lanceolate. Inflorescence terminal, emerging from the pseudostem, erect or drooping. Flowers in flat clusters in the axils of spirally arranged, broad, bright-colored bracts, functionally unisexual, the lower pistillate, the upper staminate; perianth of 5 united tepals and 1 free tepal; fertile stamens 5, with one staminode; ovary inferior, 3-locular, with many ovules, the style elongate, stout, the stigma capitate, generally 6-lobed. Fruit fleshy, indehiscent or splitting irregularly; seeds many, abortive in cultivated plants.

TYPE GENUS: *Musa* Linnaeus.

A tropical family of two genera and 42 species found in Africa, Asia, and Australia. Many cultivated forms of the plantain and the banana are important food plants.

MUSA Linnaeus

Musa L., Sp. Pl. 2: 1043. 1753.

Characters of the family.

LECTOTYPE SPECIES: *Musa paradisiaca* Linnaeus.

OBSERVATIONS: For many years the seedless bananas received a standard botanical classification: *Musa sapientum* L., the edible banana; *Musa paradisiaca*, the plantain or cooking banana; *Musa cavendishii* Lam., the Cavendish or dwarf banana. This systematic treatment was followed in most West Indian floras; however, studies reported by N. W. Simmonds (*Bananas*, 2nd ed., Longman, New York, 1966) now suggest that the cultivated edible bananas and plantains are triploid and/or interspecific hybrids between *M. acuminata* Colla and *M. balbisiana* Colla. Since cultivars perpetuated vegetatively vary in the contribution of each parent and in the

amount of ploidy represented, geneticists have concluded that binomial nomenclature can not be applied. Triploid plants derived from *M. acuminata* Colla include *M. cavendishii*, the cultivars known as dwarf Cavendish (*M. nana* sensu Stehlé) and giant Cavendish, Gros Michel, Lacatan, and Robusta. The fig or ladyfinger bananas of the West Indies are triploids involving *M. acuminata* and to a lesser degree *M. balbisiana*.

Musa textilis Née, the abaca or textile fiber plant, was introduced in the Lesser Antilles for culture by botanic gardens and departments of agriculture, but no voucher specimens have been seen.

Among the ornamental bananas reported are: 1) *Musa coccinea* Andr., a species which Fournet (Fl. Guadeloupe Martinique 252. 1978) suggests should be called *M. uranoscopus* Lour.; 2) *Musa mannii* Wendl., reported by Fournet (*ibid.*); and 3) *Musa ornata* Roxb., probably the correct name for most plants cultivated under the names *M. rosea* or *M. rosacea*.

HELICONIACEAE

HELICONIACEAE Nakai in Jour. Jap. Bot. 17: 201. 1941.

Large, rhizomatous, perennial herbs with distichous, petiolate, broad-bladed leaves. Inflorescence terminal, erect or recurved and pendulous, with distichous, colored bracts bearing axillary, glomerate or cincinnate flowers. Flowers perfect; sepals 3, with two adnate at base of corolla and one free and larger; petals united into a tube, 3-toothed at apex; fertile stamens 5, the anthers linear, the solitary staminode short and petaloid; ovary inferior, carpels 3, with one basal ovule per locule, the style filiform, the stigma clavate or capitate and 3-lobed. Fruit capsular, separating into 3 cocci or dehiscent, usually blue or black; seeds exarillate.

TYPE GENUS: *Heliconia* Linnaeus.

The family consists of only one genus with about 80 species found in tropical America.

HELICONIA Linnaeus

Heliconia L., Mant. Pl. 2: 147, 211. 1771, nom. cons.

FIGURE 117.

Characters of the family.

TYPE SPECIES: *Musa bihai* L., correctly known as *Heliconia bihai* (L.) L.

A genus of 80 tropical American species.

KEY TO THE SPECIES

1. Plants about 1 m. tall, inflorescence erect, bracts 3-5, flowers orange-yellow, the segment tips black; fruit black. *H. psittacorum*
- 1a. Plants more than 2 m. tall. 2
2. Inflorescence pendent, the rachis sinuate. *H. marginata*
- 2a. Inflorescence erect. 3

3. Bracts deeply boat-shaped, 5.0-6.5 cm. wide, the bases generally overlapping, usually deep red with green margins.*H. caribaea*
- 3a. Bracts narrowly triangular, 2.5-4.0 cm. wide, variegated scarlet with yellow margins and tips, generally clearly separated.*H. bihai*

***Heliconia bihai* (L.) L., Mant. Pl. 2: 211. 1771.**

Basionym: *Musa bihai* L., Sp. Pl. 2: 1043. 1753.

Lectotype: Plumier, Pl. Amer. 50.

Plants 1.5-4.0 m. tall. Leaves with petioles variable in length, often to 2 m.; blades elongate-oblong, sometimes 2 m. long, 20 cm. or more wide, glaucous when young, often becoming green on both surfaces, the apex cuspidate-acuminate, the base rounded to acute. Inflorescence erect, short-peduncled; bracts shallowly boat-shaped, 2.5-4.0 cm. wide, narrowly triangular, succulent, the middle ones 13 cm. long, widely separated and never overlapping at the base, generally scarlet with upper margins yellow. Flowers with perianth 3 cm. long, the tips of sepals and petals white. Fruits bright blue.

GENERAL DISTRIBUTION: Greater Antilles.

DISTRIBUTION IN LESSER ANTILLES: Antigua!, Saba, St. Eustatius, St. Kitts!, Montserrat!, Guadeloupe!, Dominica!, Martinique!, St. Lucia, St. Vincent!.

COMMON NAMES: Balisier, wild plantain.

***Heliconia caribaea* Lam., Encycl. Méth. Bot. 1: 426. 1783.**

Lectotype: Plumier, Pl. Amer. ed. Burm. t. 59.

Syn.: *Heliconia caribaea* var. *luteo-fusca* (Jacq.) Stehlé in Bull. Soc. Bot. France 123: 442. 1976, illeg.

Herbs 3-6 m. tall. Leaves with petioles to 2 m.; blades oblong or elliptic, 1 m. or more long, 20-35 cm. wide, generally green above, glaucous beneath, abruptly short-acuminate at the apex, the base acute or rounded. Inflorescence short-peduncled, 40-60 cm. long, erect, heavy; bracts deeply boat-shaped, acute to long-acuminate, 6-12 cm. long, overlapping at the base, scarlet, yellow or crimson with yellow edge. Flowers about 3 cm. long, green or greenish-yellow, the tips of sepals and petals green. Fruit deep blue.

GENERAL DISTRIBUTION: Greater Antilles.

DISTRIBUTION IN LESSER ANTILLES: Antigua!, Montserrat!, Guadeloupe!, Dominica!, Martinique!, St. Vincent!, Grenada!.

OBSERVATIONS: An unnamed form with chartreuse bracts occurs on St. Lucia and Martinique.

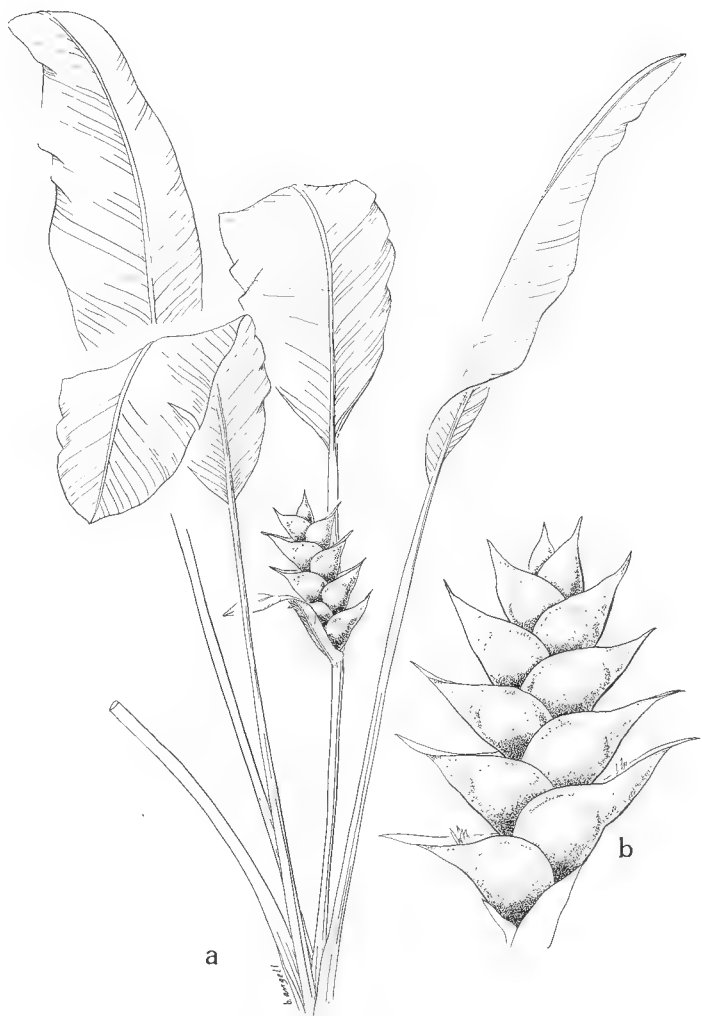


FIGURE 117. Heliconiaceae. a, b, *Heliconia caribaea*: a, habit, $\times 0.02$; b, inflorescence, $\times 0.1$.

Heliconia marginata (Griggs) Pittier, Man. Pl. Usuales Venez. 299. 1926.

Basionym: *Bihai marginata* Griggs in Bull. Torrey Bot. Club 42: 323. 1915.

Type: Panama, *R. S. Williams* 696 (holotype, NY).

Plant of 4 m. height. Leaves with petioles 30 cm. long; blades oblong, 60 cm. long, 15 cm. wide, green and glabrous, the apex acute, the base rounded. Inflorescence pendent, slender, ca. 20 cm. long, the peduncle slender, 10 cm. long, the rachis flexuous, brown-puberulent; bracts shallowly boat-shaped, reflexed, ovate-lanceolate, the middle ones 8-9 cm. long, 4 cm. wide, with apex gradually narrowed. Flowers with perianth 5 cm. long. Fruiting pedicels 15 mm.; fruit oblong.

GENERAL DISTRIBUTION: Central America.

DISTRIBUTION IN LESSER ANTILLES: Introduced into St. Vincent and established in the Richmond Valley area (R. R. Smith, pers. comm.).

Heliconia psittacorum L. f., Suppl. Pl. 158. 1781.

Lectotype: *C. G. Dalberg*, Surinam.

Stoloniferous herb usually about 1 m. tall, growing in clumps. Leaves several, petiolate; blades narrowly oblong, divaricate, to 30 cm. long, 9 cm. wide, green, the apex acuminate, the base rounded to subcordate, often oblique. Inflorescence erect; bracts 3-6, 3-6 cm. long, 1 cm. wide, orange-yellow. Flowers ca. 4.5 cm. long, yellow-orange, the segments tipped with black. Fruit black.

GENERAL DISTRIBUTION: Central and South America.

DISTRIBUTION IN LESSER ANTILLES: St. Kitts!, Martinique!, Guadeloupe!, St. Lucia!

OBSERVATIONS: This species, found at lower elevations, is commonly cultivated in city gardens and has persisted following former cultivation at ruins of plantation houses. The plant was once used as an illustration on the paper currency of Guadeloupe and Martinique.

CULTIVATED SPECIES AND UNNAMED TAXA

The following is a list of all cultivated species and unnamed taxa known to occur in the Lesser Antilles.

Heliconia brasiliensis Hook., cited by Questel (Fl. Guadeloupe 170. 1951) as cultivated at Montebello, cannot be verified.

Heliconia hirsuta L. f. is reported by Grisebach (Fl. Br. W. Ind. Isl. 600. 1864) from St. Vincent on the basis of a Guilding collection or reference. This record is taken from an inventory (compiled by Guilding) of plants presumably cultivated in the St. Vincent Botanical Garden.

Heliconia pulverulenta Lindl. was reported from Dominica by Grisebach (Fl. Brit. W. Ind. Isl. 600. 1864). The specimen on which the Hooker citation

(Curtis Bot. Mag. 78: t. 4685. 1852) is based was only a leaf fragment collected by Imray. Duss did not cite his collection (no. 2122 (NY), "cult. St. Pierre Bot. Gard. 1882") in *Flore Phanérogamique* although it was originally identified as *H. pulverulenta* Lindl. It has been annotated *H. latiospatha* Benth. var. *aurantiaca* R. R. Smith.

Heliconia sp. A number of plants from Grenada may represent either a new species or a series of hybrids between an undescribed species and *H. bihai*.

Heliconia sp. A tall robust plant from Richmond Valley, St. Vincent, intermediate in habit between *H. caribaea* and *H. bihai*, may represent a new species.

STRELITZIACEAE

STRELITZIACEAE Hutchinson, Fam. Fl. Pl. 2: 72. 1934.

Perennial rhizomatous herbs or trees, the arborescent forms resembling banana trees. Leaves distichous, long-petioled; blades oblong, large. Inflorescences axillary; peduncles usually short. Flowers large, perfect, in cincinni enclosed in cymbiform bracts; sepals 3, more or less equal; petals 3, the two lateral ones developed only on one side forming a conspicuously sagittate unit, the median one short and cymbiform; stamens 5, the filaments long and rigid, the anthers linear; ovary inferior, 3-locular, with numerous axile ovules, the style slender, rigid, the stigma 3-lobed. Fruit a woody capsule; seeds arillate.

TYPE GENUS: *Strelitzia* Aiton.

A tropical family of three genera and seven species found in South America, South Africa and Madagascar. The two species occurring in the Lesser Antilles are cultivated commonly in tropical areas.

SPECIES IN CULTIVATION

Ravenala madagascariensis Sonn.

Mature plants with a palmlike trunk. Leaf bases persisting; leaves distichous, forming a conspicuous fanlike mass. Inflorescences axillary; flowers white. Cultivated in gardens and parks, this species is originally a native of Madagascar. Common names: Traveler's palm, arbre du voyageur.

Strelitzia reginae Banks.

Herbs with acaulescent appearance. Leaves long-petioled. Inflorescence long-stalked; floral bract green; flowers appearing successively; sepals orange; petals blue, forming an arrow-shaped structure. Commonly cultivated in the Lesser Antilles and other tropical regions. Common names: Bird of paradise, oiseau de paradis.

ZINGIBERACEAE

by Paul J. M. Maas⁶

ZINGIBERACEAE L. C. Richard, Anal. Fruit. 36. 1808.

Perennial, rhizomatous, often aromatic herbs. Stems terete, straight or spirally contorted. Leaves with an open or closed leaf-sheath, ligulate, distichous or spirally arranged around the stem. Inflorescence terminal on a leafy shoot, or on a separate, leafless shoot. Flowers perfect, zygomorphic, solitary or in cincinni in the axils of bracts and bracteoles. Calyx tubular, shortly trilobate. Corolla tubular at the base, 3-lobed, the dorsal lobe somewhat larger than the two lateral ones. Labellum small or large, lateral staminodes small or large, free or completely adnate to the labellum. Stamen one, sometimes petaloid, anther dithecic. Style filiform, placed in a groove between the thecae. Stigma cup-shaped or bilamellate, sometimes with a dorsal appendage. Nectarial glands at the base of the floral tube surrounding the style base, or sunken in at the apex of the ovary (septal glands). Ovary inferior, trilocular, placentation axile, ovules numerous, anatropous. Fruit an indehiscent or loculicidally dehiscent capsule, often crowned by the persistent calyx; seeds 1-∞, arillate.

TYPE GENUS: *Zingiber* Boehm.

The family includes approximately 50 genera with about 1500 species, confined to the tropical and subtropical regions of Asia (where 80-90% of all species are found), Africa and America.

KEY TO THE GENERA

1. Leaves spirally arranged around the stem; leaf-sheaths closed. 3. *Costus*
- 1a. Leaves distichous; leaf-sheaths open. 2
2. Bracts laterally adnate to each other for about half their length, apical part free, spreading; uppermost bracts differently colored and a few of them enclosing sterile flowers; ligule ca. 1 mm. long; cultivated. *Curcuma*⁷
- 2a. Bracts free from each other. 3
3. Inflorescence terminating a leafy shoot (see also *Renealmia pyramidalis*). .. 4
- 3a. Inflorescence terminating a separate, leafless shoot. 5
4. Inflorescence a dense, spicoid, erect thyrs; bracts green; flowers white to yellow, fragrant; lateral staminodes very large. 1. *Hedychium*
- 4a. Inflorescence an open, hanging thyrs or a spicoid raceme; bracts large and red or absent; lateral staminodes very small; cultivated. *Alpinia*⁷
5. Inflorescence subsessile, arising from a basal rosette of leaf-sheaths; leaves dark purple below; labellum large, lilac, deeply 2-lobed; cultivated. *Kaempferia*
- 5a. Inflorescence with a distinct scape; leaves green; labellum small. 6

⁶ Systematic treatments for the Zingiberaceae and Cannaceae have been contributed by Dr. Paul J. M. Maas, Instituut voor systematische plantkunde, Rijksuniversiteit Utrecht, Heidelberglaan 2, Utrecht 2506 Netherlands.

6. Inflorescence spicoid; ligule 5-35 mm. long; labellum deeply 3-lobed; connective of stamen with a slender appendage, enfolding the style; rhizomes internally yellow; cultivated. *Zingiber*⁷
- 6a. Inflorescence a thyse or raceme; ligule 1-5 mm. long; connective of stamen without appendage; rhizomes internally white. 2. *Renanthera*

HEDYCHIUM Koenig

Hedychium Koenig in Retz., Obs. Bot. 3: 73. 1783.

Aromatic herbs. Leaves distichous, sessile, leaf-sheaths open. Ligule large, membranous. Inflorescence a terminal, 2- to 5-flowered, spicoid thyse. Bracts densely imbricated, persistent. Bracteoles tubular. Calyx tubular, shortly trilobate. Corolla tube long and slender, the lobes linear, shorter than the tube. Labellum large, composed of a basal claw and a deeply two-lobed limb; lateral staminodes two, nearly as long as the corolla lobes. Stamen with a very long and slender filament. Fruit a loculicidally dehiscent capsule; seeds many, with a reddish aril.

TYPE SPECIES: *Hedychium coronarium* Koenig.

Approximately 40 species in Asia, mainly in the Himalaya Region. Several species are cultivated in the neotropics.

1. **Hedychium coronarium** Koenig in Retz., Obs. Bot. 3: 73. 1783; Duss, Fl. Phan. Ant. Fr. 582. 1897; Hodge in Lloydia 17: 177. 1954.

Type: Malaya. *Koenig s.n.* (not seen, probably lost).

Plants 1.0-1.5 m. tall. Sheaths hairy, particularly near the ligule. Ligule truncate, white, membranous, 20-30 mm. long, covered with appressed hairs. Lamina narrowly elliptic, 20-50 cm. long, 3-5 cm. wide, upper side glabrous to sparsely puberulous, lower side rather densely covered with white, appressed hairs. Inflorescence ovoid, 4-10 cm. long, 3-6 cm. wide, cincinni 2- to 5-flowered. Bracts green, persistent, chartaceous, ovate-triangular, 4-7 cm. long, 2-4 cm. wide. Bracteoles 30-35 mm. long. Calyx 30-45 mm. long. Corolla white, the tube 70-80 mm. long, the lobes linear, reflexed, ca. 40 mm. long and 3 mm. wide. Labellum white, yellow at base, 40-45 mm. long and 50-60 mm. wide when spread out, limb two-lobed for about half its length, basal claw very small; lateral staminodes white, yellow at the base, elliptic, 40-55 mm. long, 15-30 mm. wide. Filament white, 25-35 mm. long, anther 12-15 mm. long. Ovary glabrous. Capsule not seen.

GENERAL DISTRIBUTION: Himalaya; now cultivated and often naturalized in tropical regions all over the world.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe, Dominica, Martinique, St. Vincent.

COMMON NAMES: Canne d'eau, Canne Rivière, Gingembre douleur.

⁷ See SPECIES IN CULTIVATION, p. 536.

According to Duss (1897), two yellow-flowered species of *Hedychium*, *H. flavum* Wall. and *H. gardnerianum* Roscoe, were cultivated in gardens of Martinique.

RENEALMIA Linnaeus f.

Renealmia L. f., Suppl. Pl. 7. 1781.

FIGURE 118.

Tall to low aromatic herbs. Leaves distichous, leaf-sheaths open, striate or smooth. Ligule truncate, small. Petiole usually small or absent. Lamina more or less narrowly elliptic in outline, cuneate at base, acute to shortly acuminate at apex. Inflorescence a thyrses or raceme, terminating a separate leafless shoot (scape), or terminal on a leafy shoot. Bracts herbaceous to membranous, mostly early deciduous, subtending 1- to 17-flowered cincinni. Peduncles (basal part of cincinnus measured from the bract to the first bracteole) usually small. Bracteoles herbaceous, tubular, closed before anthesis. Pedicels small. Calyx tubular to turbinate. Corolla tubular at base, three-lobed. Basal part of labellum narrowed, often hairy, with two very small lateral staminodes, the limb three-lobed, composed of two rounded lateral lobes and a middle lobe with an entire to irregularly lobulate apex, the lateral lobes involute or horizontally spreading. Stamen with a very small filament (ca. 1 mm. long), the anther yellow to red. Stigma cup-shaped. Nectar glands implanted at the top of the ovary, partly or completely surrounding the style base. Ovary ellipsoid to globose. Fruit a black or red, longitudinally dehiscent capsule; seeds 10-100(-160), brownish, more or less irregularly ellipsoid, with a large, membranous, orange aril.

TYPE SPECIES: *Renealmia exaltata* Linn. f.

A genus of some 80 species, of which 55 are found in the neotropics and about 25 in tropical Africa.

COMMON NAMES: Lavande rouge, Lavande blanche, Gingembre grand-bois.

KEY TO THE SPECIES

1. Inflorescence terminating a leafy stem; bracts, bracteoles and calyx mostly white; calyx 7-11 mm. long; corolla and labellum white to pinkish-white. 3. *R. pyramidalis*
- 1a. Inflorescence on a separate, leafless shoot. 2
2. Inflorescence a thyrses with 2- to 17-flowered cincinni; calyx 4-7 mm. long; bracts green; corolla yellow, 13-16 mm. long; capsule red, thin-walled, 4-12 (-14) mm. long. 2. *R. occidentalis* var. *occidentalis*
- 2a. Inflorescence a raceme, rarely a thyrses with 2- to 6-flowered cincinni; calyx (12-)15-20(-25) mm. long, early dehiscent by circumscission just above the base; bracts pinkish to red; corolla yellow to red, 27-32 mm. long; capsule red, turning black with age, thick-walled, 15-35(-40) mm. long. 1. *R. alpinia*

1. *Renealmia alpinia* (Rottboell) Maas in Acta Bot. Neerl. 24: 474. 1976; Fl. Neotropica 18: 29, f. 7. 1977.

Basionym: *Amomum alpinia* Rottboell in Soc. Med. Havn. Coll. 2: 245, 248, t. 1. 1775; Gagnepain in Bull. Soc. Bot. France 50: 194. 1903; K. Schumann in Engler, Das Pflanzenr. IV, 46: 258. 1904 (name only).

Type: Surinam. *Rolander s.n.* (specimen not seen). Holotype is Rottboell's original plate.

Syn.: *Renealmia exaltata* L. f., Suppl. Pl. 7. 1781; Duss, Fl. Phan. Ant. Fr. 581. 1897; K. Schumann in Engler, Das Pflanzenreich IV, 46: 296. 1904; H. & M. Stehlé, Fl. Agron. Ant. Fr. 10(Fl. ornament.): 140. 1958. (Type: Surinam. *Dahlberg 64* (LINN 2.1).)

Alpinia paco seroca Jacquin, Fragm. Bot. 54, t. 76. 1809, based on *Paco Seroa* Plumier, Mss. 5: t. 25; K. Schumann in Engler, Das Pflanzenr. IV, 46: 370. 1904 (name only, as "*A. paco secora*"). (Type: St. Vincent. *Plumier* or *Surian s.n.* (P?). Holotype is Jacquin's original drawing.)

Renealmia pacoseroca (Jacquin) Horaninow, Prodr. 32. 1862 (as "*Renealmia paco-secora*").

Renealmia occidentalis (Swartz) Sweet var. δ *pacoseroca* (Jacquin) O. G. Petersen in Martius, Fl. Bras. 3(3): 45. 1890 (as "var. δ *paco-secora* Griseb."); Griseb., Fl. Br. W. Ind. Isl. 601. 1864 (as "*\beta* *paro secora*").

Renealmia bracteosa Griseb., Fl. Br. W. Ind. Isl. 601. 1864; H. & M. Stehlé, Fl. Agron. Ant. Fr. 10(Fl. ornament.): 140. 1958. (Type: Dominica. *Imray s.n.*, anno 1859 (holotype, GOET; isotype, K).)

Renealmia exaltata L.f. var. β *gracilis* K. Schumann in Urban, Symb. Antill. 4: 158. 1903. (Syntypes: Puerto Rico, Luquillo Mts. *Eggers 888* (BR, GH, L, M, P, PR, W) and *Eggers 1161* (US, c in part).)

Plants 1-6 m. tall. Sheaths smooth, 10-20 mm. wide, up to 50 mm. wide at base of plant. Ligule 1-2(-4) mm. long. Petiole often absent, when present up to 30(-45) mm. long. Lamina narrowly elliptic, 30-110(-150) cm. long, (6-)8-18(-23) cm. wide, glabrous. Scape erect, reddish, 15-50 (-70) cm. tall. Inflorescence a basal raceme 12-55 cm. long, 4-8 cm. wide, rarely a basal thyse with 2- to 6-flowered cincinni, most parts densely covered with erect, simple hairs, corolla glabrous. Bracts pink to red, early deciduous, narrowly triangular to triangular, acute, (1.5-)2.0-10.0(-17.0) cm. long, 0.3-1.0(-2.0) cm. wide. Peduncles pink to red, 5-25(-35) mm. long. Bracteoles pink to red, 15-30(-35) mm. long. Pedicels pink to red, 2-8(-10) mm. long. Calyx pink to red, membranous, early, dehiscent by circumscission just above the base, (12-)15-20(-25) mm. long. Corolla yellow to red, 27-32 mm. long. Labellum yellow, tubular, ca. 12 mm. long. Anther 8-12 mm. long. Style 25-30 mm. long. Nectar glands multilobulate, completely surrounding the style base. Ovary ellipsoid, red. Capsule red, maturing black-purple, ellipsoid, crowned by the circumscissile calyx, 15-35(-40) mm. long, its wall fleshy, 0.3-1.5 mm. thick in herbarium material; seeds (30-)50-100(-160).

GENERAL DISTRIBUTION: Throughout the neotropics, except the Greater Antilles.

DISTRIBUTION IN LESSER ANTILLES: St. Kitts!, Montserrat!, Guadeloupe!, Dominica!, Martinique!, St. Vincent!, Grenada!.

2. *Renealmia occidentalis* (Swartz) Sweet, Hort. Brit. ed. 2. 493. 1830, var. *occidentalis*. Maas, Fl. Neotropica 18: 103, f. 39. 1977.

Basionym: *Alpinia occidentalis* Swartz, Prodr. 11. 1788; Fl. Ind. Occ. 1: 9. 1797.

Type: Jamaica. Swartz s.n. (lectotype, M).

Syn.: *Renealmia domingensis* Horaninow, Prodr. 32. 1862. Based on *Alpinia aromatica* Jacq. (Type: Hispaniola. Dominican Republic. Plumier or Surian s.n. (?P). Holotype is Jacquin's original drawing.)

Alpinia aromatica Jacquin, Fragm. Bot. 53, t. 74, 75. 1809, non Aublet, 1775. Based on *Paco Seroa minor multicaulis* Plumier, Mss. 5: t. 27, 28.

Renealmia aromatica Griseb. ex K. Schumann & Urban in Urban, Symb. Antill. 8: 111. 1920, excluding basionym; H. & M. Stehlé, Fl. Agron. Ant. Fr. 10(Fl. ornament.): 140. 1958.

Plants (0.8-)1.0-3.0(-4.0) m. tall. Sheaths striate, 5-15 mm. wide, up to 30 mm. wide at base of plant. Ligule 1-2 mm. long. Petiole absent or up to 10 mm. long. Lamina narrowly elliptic, 13-55 cm. long, (2-)4-12 cm. wide, glabrous. Scape 30-65(-100) cm. tall. Inflorescence a basal thyrse 10-35 cm. long, 2-7 cm. wide, cincinni 2- to 17-flowered, all parts densely to sparsely covered with simple hairs, furcate hairs rare, corolla glabrous. Bracts pale green, early deciduous, narrowly triangular-ovate to triangular-ovate, often at an angle of 45°-90° with the rhachis, 0.6-7.5 cm. long, 0.3-1.0 cm. wide. Peduncles 4-10(-12) mm. long. Bracteoles 7-17 mm. long. Pedicels 3-10(-17) mm. long. Calyx red, turbinate, 4-7 mm. long, lobes depressed-ovate, obtuse, 1-3 mm. long. Corolla yellow, 13-16 mm. long. Labellum yellow, 7-10 mm. long, composed of a basal claw 3-4 mm. long and a horizontally spreading limb 4-7 mm. long and 5-9 mm. wide. Anther 5-7 mm. long. Style 14-17 mm. long. Nectar glands only partly surrounding the style base. Ovary red. Capsule red (rarely purple-black), ellipsoid to globose, 4-12(-14) mm. long; its wall 0.1-0.2 mm. thick in herbarium material; seeds 10-25.

GENERAL DISTRIBUTION: Antilles, Central America, and northwestern South America.

DISTRIBUTION IN LESSER ANTILLES: Antigua!, Guadeloupe!, Martinique!, St. Lucia!

3. *Renealmia pyramidalis* (Lam.) Maas in Acta Bot. Neerl. 24: 479. 1976; Fl. Neotropica 18: 123, f. 47. 1977.

Basionym: *Amomum pyramidale* Lam., Encycl. Méth. Bot. 1: 137. 1783; Descourtilz, Fl. Pitt. Med. Ant. 3: 91, t. 170. 1827. (= *Alpinia racemosa* L.)

Type: Plumier, t. 20. Original herbarium material collected by Plumier or Surian in Martinique could not be located with certainty (?P).

Syn.: *Alpina racemosa* L., Sp. Pl. 1: 2. 1753. Based on *Alpina racemosa alba cannabori foliis* Plumier, Mss. 5: t. 48, and Plumier, Nov. Pl. Amer. Gen. 26, t. 11. 1703, and Plumier, Pl. Amer. (ed. Burmannus) 11, t. 20. 1755 (excl. syn.).

Renealmia racemosa (L.) A. Richard in R. de la Sagra, Hist. Fís. Pol. Nat. Cub. Fanerogam. 11: 254. 1850, non Poeppig & Endlicher, 1838; Gagnepain in Bull. Soc. Bot. France 50: 201. 1903; K. Schumann in Engler, Das



FIGURE 118. Zingiberaceae. *Renealmia pyramidalis*, redrawn from Plumier, Mss. 5: t. 48, and Pl. Amer. t. 20, $\times 0.5$.

Pflanzenr. IV, 46: 288, fig. 38n.o. 1904; Hodge in *Lloydia* 17: 177. 1954.
Renealmia caribaea Griseb., Fl. Br. W. Ind. Isl. 601. 1864; Duss, Fl. Phan.
 Ant. Fr. 580. 1897. (Type: Dominica. *Imray* 102 (GOET).)
 ?*Alpinia plumieri* Krause in Beih. Bot. Centralbl. 32(2): 338. 1914. (Type:
 St. Vincent, Soufrière. *Krause s.n.* (B, destroyed).)

Plants 1-3 m. tall. Sheaths striate, 8-10 mm. wide, to 20 mm. at base of plant. Ligule 3-4 mm. long. Petiole absent. Lamina narrowly elliptic, (15-)25-45 cm. long, (5-)8-12(-15) cm. wide, glabrous. Inflorescence a terminal thyrses 6-25 cm. long, 4-8 cm. wide, cincinni 2- to 4-flowered, most parts sparsely to densely covered with erect, simple hairs, the bracts and corolla glabrous. Bracts white, deciduous during fructification, narrowly triangular-ovate to triangular-ovate, acute or obtuse, 1-5 cm. long, 0.4-1.0 cm. wide (the lower, sterile ones 6-20 cm. long and 1.0-1.5 cm. wide). Peduncles and pedicels 5-20 mm. long. Bracteoles white, 13-20 mm. long. Calyx white to pale green, 7-11 mm. long, lobes deltate to shallowly triangular, 2-4 mm. long. Corolla white at base and white to pink at apex, 15-19 mm. long. Labellum pale pink to white, composed of a basal claw 4 mm. long, and a horizontally spreading limb ca. 4 mm. long, 8-11 mm. wide. Anther 4-6 mm. long. Style 15-16 mm. long. Nectar glands multilobulate, completely surrounding the style base, ca. 2 mm. long. Ovary green. Capsule green, maturing red and finally black, ellipsoid, 10-17 mm. long, its wall ca. 0.2 mm. thick in herbarium material; seeds 10-25.

GENERAL DISTRIBUTION: Endemic to the Lesser Antilles.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe!, Dominica!, Martinique!, St. Lucia!, St. Vincent!.

COSTUS Linnaeus

Costus L., Sp. Pl. 1: 2. 1753.

FIGURE 119.

Tall, nonaromatic herbs. Leaves spirally arranged around the stem; leaf-sheaths closed. Ligule small, (obliquely) truncate. Petiole small. Lamina usually more or less narrowly elliptic in outline, base cuneate, rounded, or cordate, apex mostly shortly acuminate. Inflorescence a strobilaceous spike, terminating a leafy stem. Bracts green to red, coriaceous, persistent, sometimes with green, foliaceous appendages. Bracteoles folded, boat-shaped. Calyx small, rarely exceeding the bracts. Corolla tubular at base, three-lobed. Labellum small and tubular or large with a distinct, spreading limb. Stamen petaloid, narrowly elliptic, the anther attached at the middle. Stigma bilamellate, with a dorsal, two-lobed appendage. Two septal nectar glands present toward the apex of the ovary. Ovary white. Capsule white, ellipsoid to globose, dehiscent or irregularly breaking when old; seeds many, glossy black, the aril large and lacerate, white.

TYPE SPECIES: *Costus arabicus* Linnaeus.

A genus of about 80 species, with 50 in the neotropics, about 25 in tropical Africa, and about 5 in tropical Asia.

COMMON NAMES: Canne-Congo, Petit dégonflé, Shell plant.

KEY TO THE SPECIES

1. All bracts provided with foliaceous, green appendages; plants densely ferrugineous-hirsute; flowers large, yellow. 6. *C. villosissimus*
- 1a. Bracts not appendaged or only the lowest provided with appendages. 2
2. Two bracteoles per bract; ligule with a salient, ciliate rim at the base; calyx much exceeding the bracts. 2. *C. lucanusianus*
- 2a. One bracteole per bract; salient, ciliate rim absent. 3
3. Bracts pungent at the apex, red; lower side of lamina densely puberulous to sericeous; corolla white, sericeous. 4. *C. speciosus*
- 3a. Bracts never pungent; corolla glabrous. 4
4. Flowers snowy white, large; calyx 18-22 mm. long; bracts green. 1. *C. arabicus*
- 4a. Flowers yellow to orange, small; calyx 3-16 mm. long; bracts orange or greenish tinged. 5
5. Calyx 9-16 mm. long; exposed part of bracts greenish. 5. *C. spicatus*
- 5a. Calyx 3-7 mm. long; exposed part of bracts orange-red. 3. *C. scaber*

1. *Costus arabicus* L., Sp. Pl. 1: 2. 1753, non Swartz; Maas, Fl. Neotropica 8: 57, f. 27. 1972.

Type: A drawing by Ehret of a plant cultivated in the Hortus Cliffortianus (Hort. Cliff. 2. 1737). It is deposited in the library of Sir Joseph Banks (BM).

Syn.: *Costus glabratus* Swartz, Prodr. 12. 1788, Fl. Ind. Occ. 1: 4. 1797; Griseb., Fl. Br. W. Ind. Isl. 602. 1864; K. Schumann in Engler, Das Pflanzenr. IV, 46: 399. 1904; H. & M. Stehlé, Fl. Agron. Ant. Fr. 10(Fl. ornament.): 52. 1958. (Type: St. Lucia. *Masson s.n.* (not seen).)

Costus niveo-purpureus Jacquin, Fragm. Bot. 55, t. 67, f. 2 & t. 79. 1809, based on *Paco Caatinga floribus amplioribus niveis et purpureis* Plumier, Mss. 5: t. 32, 33; Griseb., Fl. Br. W. Ind. Isl. 602. 1864; K. Schumann in Engler, Das Pflanzenr. IV, 46: 401. 1904. (Type: A collection of Plumier or Surian from Martinique (?). Holotype is Jacquin's drawing.)

Costus glabratus Swartz var. *β niveo-purpureus* (Jacquin) O. G. Petersen in Martius, Fl. Bras. 3(3): 53. 1890.

Plants 1-3 m. tall, often branched from the basal bracts. Ligule 2-10 mm. long. Lamina narrowly ovate to narrowly obovate, 9-25 cm. long, 3-10 cm. wide, mostly cordate at the base, the upper surface glabrous, the lower surface glabrous, sometimes puberulous. Inflorescence ovoid to fusiform, 3-10 cm. long (up to 20 cm. in fruit), 2.5-4.5 cm. wide (up to 6 cm. in fruit). Bracts green where exposed, red where covered, broadly ovate, acute to obtuse, 2.5-4.5 cm. long, 2-3 cm. wide, glabrous or rarely puberulous, callus 3-7 mm. long. Bracteoles 25-30 mm. long, glabrous to sparsely puberulous. Calyx reddish, 20-25 mm. long, glabrous to puberulous, lobes deltate, 2-6 mm. long. Corolla snowy white, 60-70 mm. long, glabrous. Labellum snowy white, broadly obovate when spread out, 50-70 mm. long and wide, the lateral lobes often tinged with purple, the middle lobe recurved, blotched with yellow in the center. Stamen snowy white, apex

tinged with purple, 40–50 mm. long, 10–15 mm. wide. Ovary glabrous to sericeous. Capsule ellipsoid, 10–18 mm. long.

GENERAL DISTRIBUTION: Tropical South America and the Antilles.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe!, Martinique!, St. Lucia!, St. Vincent!.

2. *Costus lucanusianus* J. Braun & K. Schumann in Mitt. Deutsch. Schutzgeb. 2: 151. 1899; K. Schumann in Engler, Das Pflanzenr. IV, 46: 392, f. 46. 1904; Maas, Fl. Neotropica 8: 121. 1972.

Type: Cameroon, Batanga. *Joh. Braun s.n.* (B, probably destroyed).

Syn.: *Costus dussii* K. Schumann in Engler, Das Pflanzenr. IV, 46: 402, f. 45B. 1904. (Type: Martinique, "Hauteurs du Carbet et Fonds Saint Denis." *Duss 2109b* (B, holotype, destroyed; lectotype, NY).)

Plants 1–2 m. tall. Ligule 1–2 mm. long, with a salient, ciliate rim at the base. Lamina narrowly elliptic, 12–26 cm. long, 4.5–7.0 cm. wide, rounded to slightly cordate at base, the upper surface glabrous, the lower surface densely sericeous. Inflorescence globose to cylindric, 4.5–7.0 (–14.0) cm. long, 5–6 cm. wide. Bracts green, broadly ovate, obtuse, 1.5–2.5 cm. long and wide, glabrous to sparsely puberulous toward the margins, callus 1–3 mm. long. Bracteoles 15 mm. long, glabrescent. Calyx green, far exceeding the bracts, 17–20 mm. long, glabrescent, the lobes deltate, reflexed, 5–7 mm. long. Corolla white, 40 mm. long, glabrous. Labellum white, striped with dark purple, yellow in the middle, broadly obovate when spread out, ca. 40 mm. long. Stamen 32 mm. long, 10–12 mm. wide. Ovary glabrous. Capsule globose, 14–15 mm. in diameter.

GENERAL DISTRIBUTION: Tropical western and central Africa; introduced and (?) naturalized in Martinique.

DISTRIBUTION IN LESSER ANTILLES: Martinique! (*Belanger 761* (P), *Duss 2109b* (NY), and *Hahn s.n.* (P)).

3. *Costus scaber* Ruiz & Pavon, Fl. Peru. 1: 2, t. 3. 1798; K. Schumann in Engler, Das Pflanzenr. IV, 46: 406. 1904; Maas, Fl. Neotropica 8: 92, f. 43. 1972.

Type: Peru, "in silvis Pillao, Chinchao, Cuchero et Pozuzo." *Ruiz & Pavon s.n.* (MA).

Syn.: *Costus anachiri* Jacquin, Fragm. Bot. 55, t. 78. 1809, based on *Paco Caatinga clava rubente maior* Plumier, Mss. 5: t. 31. (Type: St. Vincent. *Plumier* or *Surian* (?). Holotype is Jacquin's drawing.)

Costus spicatus Swartz β *anthocono purpurascens* Horaninow, Prodr. 37. 1862. (= *Costus anachiri* Jacquin.)

Costus cylindricus Jacquin var. β *anachiri* (Jacquin) O. G. Petersen in Martius, Fl. Bras. 3(3): 54. 1890.

Costus cylindricus auct., non Jacquin; Griseb., Fl. Br. W. Ind. Isl. 602. 1864, pro parte majore.

Slender plants 0.5–3.0 m. tall. Ligule 2–12 mm. long. Lamina narrowly elliptic, 10–32 cm. long, 3–11 cm. wide, mostly cuneate to rounded at the base, the upper surface mostly glabrous except for the densely strigulose midrib, the lower surface glabrous to puberulous. Inflorescence narrowly cylindric to ovoid, 4–10 cm. long (up to 22 cm. in fruit), 1.5–3.5 cm. wide (up to 4.5 cm. in fruit). Bracts orange-red to red, broadly ovate, obtuse, 2.0–3.5 cm. long and wide, glabrous to puberulous, margins of covered part very typically dilacerating into fibers, callus 2–10 mm. long. Bracteoles 9–12(–17) mm. long, glabrous to puberulous. Calyx reddish, 3–7 mm. long, puberulous to glabrous, lobes very shallowly triangular, ca. 1 mm. long. Corolla orange to yellow, 35–40 mm. long, glabrous. Labellum yellow, tubular, oblong-obovate when spread out, 20–30 mm. long, 15–20 mm. wide. Stamen red to orange-red, equaling or slightly exceeding the labellum, 20–25 mm. long, 6–8 mm. wide. Ovary glabrous to puberulous, rarely sericeous. Capsule ellipsoid to subglobose, 7–12 mm. long.

GENERAL DISTRIBUTION: Throughout the neotropics.

DISTRIBUTION IN LESSER ANTILLES: St. Vincent!, Grenada!.

4. *Costus speciosus* (Koenig) J. E. Smith in Trans. Linn. Soc. 1: 249. 1791; Duss, Fl. Phan. Ant. Fr. 582. 1897; Boldingh, Fl. Nederl. W. Ind. Eil. 153. 1913; H. & M. Stehlé, Fl. Agron. Ant. Fr. 10(Fl. ornement.): 52. 1958; Maas, Fl. Neotropica 8: 121. 1972.

Basionym: *Banksia speciosa* Koenig in Retz., Obs. Bot. 3: 75. 1783.

Type: "Ind. Orient." Koenig s.n. (C).

Syn.: *Costus spicatus* (Jacquin) Swartz var. *β pubescens* Griseb., Fl. Br. W. Ind. Isl. 602. 1864. (Type: St. Vincent. *Guilding* s.n. (K).)

Plants 0.5–3.0 m. tall. Ligule 1–2 mm. long. Lamina narrowly elliptic, 12–25 cm. long, 3–6 cm. wide, cuneate to rounded at base, the upper surface glabrous, the lower surface densely puberulous to sericeous. Inflorescence ovoid to broadly ovoid, 4–7 cm. long, 3–5 cm. wide. Bracts red to brownish-red, narrowly ovate-triangular, acute, 2.5–3.5 cm. long, 1.0–2.5 cm. wide, puberulous to glabrous, apex ending in a 2–10 mm. long, mostly pungent point. Bracteoles 18–20 mm. long, sparsely puberulous. Calyx reddish-brown (to green), 22–25 mm. long, sparsely puberulous, exceeding the bracts, bicarinate on the adaxial side, lobes triangular, 5–7(–12) mm. long. Corolla pinkish-white, ca. 60 mm. long, densely sericeous. Labellum white to pinkish-white, broadly obovate when spread out, 60–70 mm. long, 80–100 mm. wide. Stamen white to yellowish-white, 45–50 mm. long, 7–15 mm. wide. Ovary sericeous. Capsule ellipsoid, 10–25 mm. long, almost woody in texture.

GENERAL DISTRIBUTION: A very common species in Indo-Malaysia, from India and the Central Himalaya in the west to New Guinea in the east; cultivated in South America and often naturalized s.n. in the Antilles.

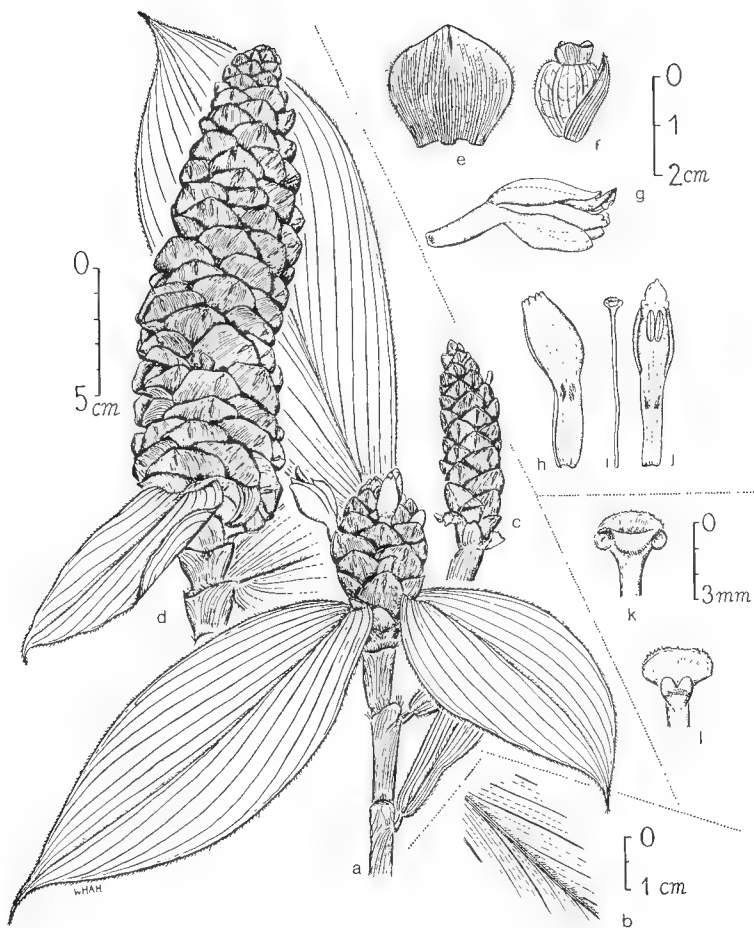


FIGURE 119. Zingiberaceae. a-l, *Costus scaber*: a, upper part of stem; b, upper leaf surface; c, inflorescence; d, infructescence; e, bract; f, bracteole and capsule; g, flower; h, labellum; i, style and stigma; j, stamen; k, l, two views of stigma. (Reprinted with permission, from P. J. M. Maas, Costoideae, in *Flora Neotropica* 8: 95, fig. 43. 1972.)

DISTRIBUTION IN LESSER ANTILLES: St. Eustatius, Guadeloupe!, Martinique!, St. Lucia!, St. Vincent!, Grenada!.

5. *Costus spicatus* (Jacquin) Swartz, Prodr. 11. 1788, Fl. Ind. Occ. 1: 6. 1797; Griseb., Fl. Br. W. Ind. Isl. 602. 1864, excl. var. β ; Duss, Fl. Phan. Ant. Fr. 581. 1897; K. Schumann in Engler, Das Pflanzenr. IV, 46: 402. 1904; H. & M. Stehlé, Fl. Agron. Ant. Fr. 10 (Fl. ornament.): 52, 53, t. 1. 1958; Maas, Fl. Neotropica 8: 103, f. 49. 1972.

Basionym: *Alpinia spicata* Jacquin, Stirp. Amer. 1, t. 1. 1763.

Type: Martinique. *Jacquin s.n.* (w, destroyed in World War II). Holotype is Jacquin's original drawing.

Syn.: *Costus cylindricus* Jacquin, Fragm. Bot. 54, t. 77. 1809, based on *Paco Caatinga caule spirali minor* Plumier, Mss. 5: t. 30; Griseb., Fl. Br. W. Ind. Isl. 602. 1864, pro parte minore; K. Schumann in Engler, Das Pflanzenr. IV, 46: 405, f. 45A. 1904, excl. var. α and β ; Hodge in Lloydia 17: 177. 1954; H. & M. Stehlé, Fl. Agron. Ant. Fr. 10 (Fl. ornament.): 52. 1958. (Type: Martinique. *Plumier* or *Surian s.n.* (p, not seen). Holotype is Jacquin's drawing.)

Costus micranthus Gagnepain in Bull. Soc. Bot. France 50: 586. 1903; K. Schumann in Engler, Das Pflanzenr. IV, 46: 440. 1904. (Type: Probably originating from Martinique. *Hort. Bot. Paris.*, October 1903 (p).)

Plants 1.0–2.5 m. tall. Ligule 2–10 mm. long. Lamina narrowly elliptic, 7–33 cm. long, 3.5–8.5(–10.5) cm. wide, rounded (to cordate) at the base, glabrescent on both sides, midrib on upper side of lamina often strigulose. Inflorescence ovoid, 5–27 cm. long, 3.0–4.5(–6.0) cm. wide. Bracts greenish or reddish where exposed, reddish where covered, broadly ovate, obtuse, 2–4 cm. long and wide, glabrous, margins of covered part dilacerating into fibers, callus 5–10 mm. long. Bracteoles 17–30 mm. long, sparsely puberulous to glabrous. Calyx 9–16 mm. long, sparsely puberulous to glabrous, lobes shallowly triangular, 2–3 mm. long. Corolla yellow to pink, 40–50 mm. long, glabrous. Labellum yellow, tubular, broadly oblong-obovate when spread out, 25–50 cm. long and wide. Stamen 30–40 mm. long, ca. 10 mm. wide. Ovary sericeous, rarely glabrous. Capsule ellipsoid, 10–15 mm. long.

GENERAL DISTRIBUTION: Hispaniola and the Lesser Antilles.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe!, Marie Galante!, Dominical, Martinique!.

The floral structure of this species is very poorly known. Collectors should make a special effort to obtain additional flowering material of this species.

6. *Costus villosissimus* Jacquin, Fragm. Bot. 55, t. 80. 1809, based on *Paco-Caatinga villosissima flore luteo* (= *Zinziber villosissimum floribus luteis*) Plumier, Mss. 5: t. 34; K. Schumann in Engler, Das Pflanzenr. IV, 46: 387. 1904; Maas, Fl. Neotropica 8: 48, f. 23. 1972.

Type: St. Vincent. *Plumier* or *Surian* (p?). Holotype is Jacquin's drawing.

Plants 1-4(-6) m. tall, densely ferrugineous-hirsute throughout. Ligule 2-10 mm. long. Lamina narrowly elliptic to narrowly obovate, 15-30(-62) cm. long, 4.5-8.0(-14.0) cm. wide, mostly cordate at the base. Inflorescence ovoid, 6-10 cm. long (up to 20 cm. in fruit), 3.5-6.5 cm. in diameter (up to 8.5 cm in fruit). Bracts green or red, broadly ovate, 2-4(-6) cm. long, 2.5-4.0 cm. wide, callus absent or to 6 mm. long; appendages foliaceous, green, slightly recurved (in living material), narrowly triangular to deltate, 1-8 (-16) cm. long, 1-3(-8) cm. wide. Bracteoles 17-30 mm. long, glabrous or nearly so. Calyx 8-16 mm. long, glabrous to sparsely puberulous, lobes deltate, 4-6 mm. long. Corolla yellow, 60-80 mm. long, glabrous. Labellum yellow, broadly obovate when spread out, 70-90 mm. long, ca. 60 mm. wide. Stamen yellow, ca. 50 mm. long, up to 15 mm. wide. Ovary glabrous to densely sericeous at the apex. Capsule ellipsoid, 15-25 mm. long.

GENERAL DISTRIBUTION: Central America, Jamaica, and northwestern South America.

DISTRIBUTION IN LESSER ANTILLES: St. Vincent!.

It is rather peculiar that this species has never been collected in St. Vincent since the time of Plumier's type collection.

SPECIES IN CULTIVATION

The following genera and species have been reported under cultivation in the Lesser Antilles.

Alpinia Roxburgh, *Asiat. Res.* 11: 350. 1810, nom. cons.

Rhizomatous herbs with well-developed leafy stems. Leaves with a short or long petiole. Ligule small. Inflorescence thyrsoid or racemose, terminating the leafy stem. Bracts absent or small, in a few species large. Bracteoles variously shaped. Flowers in cincinni of 2-several flowers or solitary in the axil of a bract. Calyx tubular to turbinate, shortly 3-lobed. Corolla tube about as long as the calyx. Labellum small to large, provided with two very small lateral staminodes at the base. Stamen with a long to very short filament, often longer than the anther, the connective without or with a very small apical appendage. Capsule variously shaped.

KEY TO THE SPECIES

1. Inflorescence hanging; bracts absent; labellum large, yellowish with red. *A. zerumbet*
- 1a. Inflorescence erect; bracts red; labellum small, white. *A. purpurata*

Alpinia zerumbet (Persoon) Burt & R. R. Smith, *Notes Roy. Bot. Gard. Edinburgh* 31: 204. 1972 (basonym: *Costus zerumbet* Pers., *Syn.* 1: 3. 1805; syn.: *Alpinia speciosa* (Wendl.) K. Schumann, *Fl. Kaiser-Wilhelmsl.* 29. 1887; *Alpinia nutans* sensu Roscoe in J. E. Smith, *Exot. Bot.* 2:t. 106. 1805).

Plants to 3 m. tall. Ligule up to 12 mm. long, obtuse, outer side densely hairy. Petiole to 10 mm. long. Lamina 25-70 cm. long, up to 10 cm. wide. Inflorescence thyrsoid, decurved or hanging, up to 40 cm. long; rhachis densely puberulous. Bracts absent. Bracteoles 20-30 mm. long, white with red apex; calyx 15-18 mm. long, white with red apex. Corolla white, about 40 mm. long. Labellum ca. 40 mm. long and 30 mm. wide, yellowish throughout with reddish variegations within. Stamen ca. 25 mm. long. Capsule red, globose, ca. 20 mm. in diameter.

Native of Asia, but cultivated all over the tropics because of its beautiful flowers.

COMMON NAMES: Shell flower, shell ginger, pink porcelain lily.

Alpinia purpurata Vieill. ex K. Schumann in Engler, Das Pflanzenr. IV, 46: 323, f. 40A. 1904 (basonym: *Guillainia purpurata* Vieill., Bull. Soc. Linn. Normandy 10: 92. 1866).

Plants 1-2 m. tall. Ligule 5-8 mm. long. Leaves subsessile, narrowly elliptic, 20-35 cm. long, 4-7 cm. wide. Inflorescence racemose, 8-25 cm. long, 4-5 cm. wide. Bracts red, persistent, curved outward, narrowly obovate, 30-40 mm. long. Bracteole equaling the bracts in color and size. Calyx tubular, 8-15 mm. long; corolla white, ca. 30 mm. long. Labellum white, ca. 10 mm. long. Stamen subsessile, with a connective appendage 2 mm. long. Capsule up to 30 mm. long, red; seeds red.

COMMON NAME: Red ginger.

Curcuma Linnaeus, Sp. Pl. 1: 2, 1753.

Herbs with tuberous, internally yellow to orange rhizomes and rather low, leafy stems. Ligule small. Leaves often with a purplish band along the midrib. Inflorescence dense, spicoid, either terminal on a leafy shoot or on a separate, leafless shoot. Flowers in cincinni of 2-7 in the axil of a bract. Bracts large and wide, laterally adnate to each other for about half their length, the apical part free, spreading; uppermost bracts often differently colored and a few of them sterile. Bracteoles thin. Calyx short, unequally toothed. Corolla white to pale yellow. Labellum obovate with a faintly 2-lobed apex and with a thickened yellow zone in the middle; staminodes large, more or less elliptic. Stamen with a short filament; anther with a curved spur at the base, the connective sometimes prolonged into a small crest. Capsule ellipsoid, dehiscent; seeds with a lacerate aril.

KEY TO THE SPECIES

1. Leaves completely green; bracts pale green, the upper ones whitish; inflorescence terminal on a leafy shoot, appearing between the sheaths. *C. longa*
- 1a. Leaves with a 1-2 cm. wide purplish band all along the midrib; bracts greenish, the upper ones purplish-margined or completely purple; inflorescence on a separate, leafless shoot. *C. xanthorrhiza*

Curcuma longa Linnaeus, Sp. Pl. 1: 2. 1753.

Plants to 1 m. tall. Ligule 1 mm. long. Petiole 0.5–10 cm. long; lamina green, narrowly elliptic, 7–70 cm. long, 2.5–18 cm. wide. Inflorescence cylindric, 5–20 cm. long, terminal on a leafy shoot, appearing between the sheaths. Scape 3–20 cm. long. Bracts pale green, the upper ones whitish, 50–75 mm. long. Bracteoles ca. 35 mm. long. Calyx 8.5 mm. long. Corolla yellowish-white, 45–55 mm. long. Labellum white with a yellow central streak, 12–17 mm. long; staminodes obovate, 10 mm. long. Fruit unknown.

This species, a native of Asia, is cultivated throughout the tropics for its rhizome. Dried and ground, turmeric yields a commercial dyestuff as well as a spice. For further discussion of the correct name of this species, see Burt & Smith, in Notes Roy. Bot. Gard. Edinburgh 35: 209–213. 1977.

Curcuma xanthorrhiza Roxb., Fl. Ind. 1: 25. 1820.

Plants to 2 m. tall. Ligule 1 mm. long. Petiole absent or up to 30 cm. long. Lamina narrowly elliptic, 30–90 cm. long, 7–21 cm. wide, with a 1–2 cm. wide purplish zone on each side of the midrib. Inflorescence 10–20 cm. long, on a separate leafless shoot 15–20 cm. long. Bracts greenish, the upper ones purplish, 50–90 mm. long. Bracteoles 15–25 mm. long. Corolla 40–60 mm. long, the lobes pale red. Labellum yellowish, 14–18 mm. long; staminodes elliptic to obovate, 15–20 mm. long. Fruit unknown.

Kaempferia Linnaeus, Sp. Pl. 1: 2. 1753.

Low herbs with fleshy rhizomes, roots often with tubers. Ligule small. Leaves few, clustered at the base, short-petiolate. Inflorescence enclosed by imbricating leaves or leaf-sheaths. Bracts closely imbricate, much longer than wide. Flowers solitary in the axil of a bract. Bracteoles small, bidentate to bifid. Calyx tubular, partly split. Corolla long. Labellum large, deeply 2-lobed; staminodes petaloid, large, similar to the halves of the labellum. Stamen with a very short filament, the connective with a large, entire or lobed crest. Fruit a capsule; seeds with a lacerate aril.

Kaempferia rotunda Linnaeus, Sp. Pl. 1: 3. 1753 (syn.: *Kaempferia longa* Jacquin, Hort. Schoenbr. 3: t. 317. 1798).

Plants to 50 cm. tall, with rhizomes short-creeping and roots with tubers. Ligule 4 mm. long. Leaves 2–5, rather long-petiolate, 10–45 cm. long, 5–11 cm. wide, the upper side variegated, the lower side purplish. Inflorescence 4- to 16-flowered, borne at or near the ground level, surrounded by strongly reduced leaves. Bracteole 15–23 mm. long. Calyx greenish, 30–70 mm. long. Corolla white, 80–140 mm. long. Labellum lilac, 40–70 mm. long, 30–40 mm. wide, obcordate; staminodes elliptic to linear, 33–50 mm. long, white or lilac. Stamen 15–25 mm. long. Fruit unknown.

This plant, a native of Southeast Asia, is cultivated as an ornamental.

COMMON NAME: Resurrection lily.

Zingiber Boehm. in Ludw., Defin. Gen. Pl. 89. 1760, nom. cons.

Plants with internally yellowish rhizomes and rather long, leafy stems.

Ligule small, deeply 2-lobed or entire. Leaves short-petiolate to sessile. Inflorescence spicoid, terminating a separate, leafless shoot. Flowers solitary in the axils of imbricate bracts. Bracteole one per flower, split to the base. Calyx thin, tubular, usually shorter than the bracteole. Corolla white to creamy. Labellum and 2 staminodes joined into a deeply 3-lobed organ. Stamen with a short filament, the connective prolonged into a slender, beaklike appendage enfolding the style. Capsule with shining black seeds and a white aril.

KEY TO THE SPECIES

- 1. Leaves linear, not over 2 cm. wide; ligule 5-10 mm. long. *Z. officinale*
- 1a. Leaves narrowly elliptic, 3.0-8.5 cm. wide; ligule 15-35 mm. long.
 *Z. zerumbet*

Zingiber officinale Roscoe in Trans. Linn. Soc. 8: 348. 1807 (syn.: *Amomum zingiber* Linnaeus, Sp. Pl. 1: 1. 1753).

Plants 0.3-1.0 m. tall. Ligule 5-10 mm. long, slightly 2-lobed. Leaves sessile, linear, 5-25 cm. long and up to 2 cm. wide. Inflorescence narrowly ellipsoid, 3.5-5.0 cm. long; scape to 25 cm. long. Bracts pale green, 2.5 cm. long. Bracteole as long as the bract. Calyx 10-12 mm. long. Corolla greenish-yellow, 35-50 mm. long. Labellum dark purple, creamy-blotched at the base, 12-15 mm. long. Fruit unknown.

This species is cultivated all over the tropics for its rhizome, "ginger," which is used as a spice and also as a medicine.

COMMON NAMES: Common ginger, true ginger.

Zingiber zerumbet (L.) J. E. Smith, Exot. Bot. 2: 103, t. 112. 1805 (basionym: *Amomum zerumbet* Linnaeus, Sp. Pl. 1: 1. 1753).

Plants to about 1 m. tall. Ligule 15-35 mm. long. Petiole 0-6 mm. long; lamina narrowly elliptic, 14-40 cm. long, 3.0-8.5 cm. wide. Inflorescence spicate, ovoid to ellipsoid, 6-12 cm. long; scape 15-45 cm. tall. Bracts 30-35 mm. long, green when young, becoming red when old. Bracteole ca. 25 mm. long. Calyx 13-17 mm. long. Corolla yellow to white, 3.5-5.5 cm. long. Labellum ca. 20 mm. long, yellowish to white. Fruit obovoid, ca. 15 mm. long.

This species has uses similar to *Z. officinale*.

CANNACEAE

by Paul J. M. Maas

CANNACEAE A. L. de Jussieu, Gen. 62. 1789.

Perennial, rhizomatous herbs. Leaves consisting of an open sheath and a large lamina, ligule wanting. Inflorescence terminal, racemiform or paniculate, the membranaceous bracts and bracteoles subtending a single

flower or a cincinnus of 2 flowers. Inflorescence branches each with one primary bract (10–30 cm. long) and two branch-bracts (5–20 cm. long). Flowers bisexual, asymmetric, often large, sessile or shortly pedicellate, red to yellow (white or orange in specimens not from the Lesser Antilles). Sepals 3, imbricate, free, all equal. Petals 3, unequal, connate at base into a short tube. Stamen one, petaloid, with a solitary, marginal theca, more or less adnate at base to the fleshy petaloid style and the petaloid inner staminode. Inner staminode (labellum) one, often recurved, smaller than the outer ones; outer staminodes 0–3, exceeding the petals, connate at base with the labellum, style, and stamen into a tube. Septate nectar glands present. Ovary inferior, trilocular, verrucose to tuberculate; ovules numerous, axillary, anatropous. Fruit a large, verrucose to tuberculate, loculicidally dehiscent capsule, becoming glabrous with age, crowned by the persistent sepals; seeds numerous, globose to ellipsoid, very hard, black to dark brown, without aril.

TYPE GENUS: *Canna* Linnaeus.

Only one genus, *Canna*, with nine species in tropical and subtropical America; some species naturalized in Asia and Africa.

KEY TO THE SPECIES

1. Flowers 4–7.5 cm. long, reddish, rarely yellowish; leaves not glaucous, acute to shortly acuminate at apex. 1. *C. indica*
- 1a. Flowers 8–10 cm. long, pale yellow; leaves glaucous, very gradually narrowed toward the apex. 2. *C. glauca*

1. *Canna indica* L., Sp. Pl. 1: 1. 1753; Griseb., Fl. Br. W. Ind. Isl. 603. 1864; Duss, Fl. Phan. Ant. Fr. 586. 1897; Boldingh, Fl. Nederl. W. Ind. Eil. 153. 1913.

Lectotype: Not yet selected.

Syn.: *Canna coccinea* Miller, Gard. Dict. ed. 8. *Canna* no. 10. 1768; Griseb., Fl. Br. W. Ind. Isl. 603. 1864; Duss, Fl. Phan. Ant. Fr. 586. 1897. (Type: Cultivated in Hort. Bot. Chelsea from seeds of "America and Brazil" (BM).)

Canna lambertii Lindley in Edw. Bot. Reg. 6: t. 470. 1820 (as "*C. lamberti*"); Griseb., Fl. Br. W. Ind. Isl. 603. 1864; Hodge in Lloydia 17: 176. 1954. (Type: "Cultivated from seeds collected in the Island of Trinidad." Holotype is Lindley's original drawing.)

Canna edulis Ker-Gawler in Edw. Bot. Reg. 9: t. 775. 1824; Griseb., Fl. Br. W. Ind. Isl. 603. 1864; Duss, Fl. Phan. Ant. Fr. 587. 1897. (Type: Cultivated from seeds collected by Ruiz and Pavon in Peru. Holotype is Ker-Gawler's original drawing.)

Canna pallida Roscoe, Monandr. Pl. t. 19. 1828; Griseb., Fl. Br. W. Ind. Isl. 603. 1864; Duss, Fl. Phan. Ant. Fr. 587. 1897. (Type: Cultivated at Hort. Bot. Liverpool from seeds sent by Lord Seaforth from Barbados (K).)

Canna occidentalis Roscoe in Edw. Bot. Reg. 9: t. 772. 1824. (Type: Cultivated from seeds probably collected in the West Indies. Holotype is Roscoe's original drawing.)

Canna lagunensis Lindley in Edw. Bot. Reg. 16: t. 1311. 1830. (Type: Bot.

Reg. t. 1311, drawn from specimens received by Lindley from A. B. Lambert; originally collected from "Laguna, in Mexico.")

Canna pallida Roscoe var., Roscoe, Monandr. Pl. t. 20. 1828. (Type: Cultivated at Hort. Bot. Liverpool from seeds collected in the West Indies. Holotype is Roscoe's original drawing.)

Canna fulgida Bouché in Linnaea 18: 490. 1844. (Type: "Crescit in insula St. Bartholomaei." Cultivated at Hort. Bot. Berlin, destroyed in 1944.)

Plants 1-2 m. tall. Rhizomes stout, sometimes tuberous. Leaves ovate to narrowly elliptic, 20-50 cm. long, 10-20 cm. wide, base rounded or attenuate, apex acute to shortly acuminate. Inflorescence simple or branched, bearing several solitary flowers or 2-flowered cincinni. Floral bracts ovate to obovate, 1-3 cm. long; bracteoles (narrowly) ovate-triangular, 0.5-1.5 cm. long. Sepals ovate to narrowly ovate, 0.7-2.0 cm. long. Corolla red to yellow, 4.0-6.5 cm. long, the tube 1-2 cm. long, the lobes linear, 3-5 cm. long. Outer staminodes 2-3, red to yellow, narrowly elliptic to narrowly obovate, apex entire or emarginate, 5.0-7.5 cm. long (including the basal tubular part). Inner staminode (labellum) mostly red and dotted yellowish to pinkish at base or completely yellow, recurved, narrowly oblong-ovate, 4.5-6.5 cm. long, 0.4-1.0 cm. wide, apex mostly emarginate. Stamen 4-6 cm. long. Style 4-6 cm. long. Capsule ellipsoid to globose, 1.5-4.0 cm. long.

GENERAL DISTRIBUTION: Very common throughout tropical and subtropical America; naturalized in Asia and tropical Africa.

DISTRIBUTION IN LESSER ANTILLES: St. Martin, St. Barthelemy!, Antigua!, Sabal, St. Eustatius!, St. Kitts!, Guadeloupe!, Dominica!, Martinique!, St. Vincent!, Grenada!, Barbados.

COMMON NAMES: Balisier, balisier à chapelets, balisier rouge, balisier jaune, cannon, graine à chapelets, Indian shot, scarlet shot, toloman, toloman batard, tous-les-mois.

This species is a nightmare to every taxonomist! It very frequently escapes from cultivation and is easily hybridized with wild specimens. At this stage of my research, I have included many different names in one large and complex species, *Canna indica*. A better solution can be found only after years of field work and cultivation experiments.

2. *Canna glauca* L., Sp. Pl. 1: 1. 1753; Griseb., Fl. Br. W. Ind. Isl. 603. 1864; Duss, Fl. Phan. Ant. Fr. 587. 1897.

Lectotype: Not yet designated.

Plants up to 1.5 m. tall. Rhizomes long-creeping, fleshy, to 1.5 cm. in diameter, densely rooted. Leaves narrowly ovate to narrowly elliptic, 30-50 cm. long, 3-15 cm. wide, very gradually narrowed toward the apex, base narrowly cuneate, glaucous, often dark brown in herbarium material. Inflorescence mostly simple, bearing 2-flowered cincinni of shortly pedicellate flowers (pedicels up to 1 cm. long in fruit). Floral bracts ovate to broadly ovate, 0.7-2.5 cm. long; bracteoles broadly ovate to ovate-triangular, 0.3-

2.0 cm. long. Sepals narrowly elliptic-triangular, 1.0-2.5 cm. long. Corolla pale yellow, 7-9 cm. long, the tube ca. 2 cm. long, the lobes narrowly ovate, 5-7 cm. long. Outer staminodes 3, pale yellow, narrowly obovate to narrowly elliptic, 8-10 cm. long (including basal tubular part). Inner staminode (labellum) pale yellow, strongly recurved, narrowly elliptic to narrowly obovate, 7.5-8.0 cm. long. Stamen pale yellow, free part 3.5-4.5 cm. long. Style yellow, free part 4-5 cm. long. Capsule ellipsoid to globose, 2-6 cm. long.

GENERAL DISTRIBUTION: Throughout the neotropics; in margins of very wet vegetation.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe!, Martinique!

COMMON NAMES: Balisier jaune, toloman.

MARANTACEAE

MARANTACEAE Petersen in Engler & Prantl, Nat. Pflanzenfam. II, 6: 33. 1888.

Perennial herbs, acaulescent or with elongate stems. Leaves distichous, vaginate at base, the petioles callose at apex. Inflorescence capitate, spicate, racemose or paniculate. Flowers perfect, very irregular, arising from a 2-valved, spathe-like unit of 2 bracts; sepals 3, mostly free, equal; petals 3, united below into a tube, contorted, unequal, often cucullate; fertile stamen 1, the anther 1-celled, staminodes 2, free or connate with the fertile stamen, petaloid; ovary inferior, 1- to 3-celled, with ovules solitary in each cell, the style recurved, simple. Fruit capsular or nutlike or fleshy; seeds solitary in each cell, hard, arillate.

TYPE GENUS: *Maranta* Linnaeus.

A chiefly New World family of about 400 species of herbaceous perennials classified in 30 genera. This family is distinguished from the Zingiberaceae by the characteristic swollen pulvinus or joint at the junction of petiole and leaf blade. For further information on the family classification, see R. A. Howard, Nomenclatural notes on some Lesser Antillean Monocotyledoneae, in Jour. Arnold Arb. 60: 290-301. 1979.

KEY TO THE GENERA

1. Flowers borne in large bracteate spikes; ovary and fruit 3-celled. . . . *Calathea*
- 1a. Inflorescence open and branched; ovary and fruit 1-celled. 2
2. Bracts of the inflorescence early deciduous; plants 0.3-1.0 m. tall; fruit indehiscent. *Maranta*
- 2a. Bracts of the inflorescence persistent; plants 2-3 m. tall; fruit dehiscent. *Ischnosiphon*

CALATHEA G. F. W. Meyer

Calathea G. F. W. Meyer, Prim. Fl. Esseq. 6. 1818.

FIGURE 120.

Perennial herbs, rhizomatous, stems leafy at base. Leaves distichous,

vaginate, petioles long or short, blades large. Inflorescence spicate, sessile or pedunculate; bracts spiral or distichous, membranous or indurate. Flowers in 3 or more pairs in each bract; sepals 3, equal, free; corolla tube elongate, lobes 3, spreading; staminodes 2, the outer one usually larger, the inner one bearing a 1-celled anther; ovary 3-celled with 1 ovule per cell, the style adnate to staminodial tube. Capsule often hard, 3-celled; seeds angled, arillate.

TYPE SPECIES: *Maranta casupo* Jacq., correctly known as *Calathea lutea* (Aubl.) Meyer ex Koernicke.

A genus of about 150 species occurring in tropical continental America and the West Indies.

KEY TO THE SPECIES

1. Bracts distichous; perianth yellow. *C. lutea*
- 1a. Bracts spiral. 2
2. Plants at least 1 m. tall; spikes ellipsoid, 6-9 cm. long; corolla white.
- *C. allouia*
- 2a. Plants small, stems 5 cm. long; spikes ovate, 15 cm. long, 9 cm. wide; corolla yellow. *C. martinicensis*

***Calathea allouia* (Aubl.) Lindley in Edw. Bot. Reg. 14: under plate 1210. 1829.**

Syn.: *Maranta allouia* Aublet, Pl. Guian. 1: 3. 1775.

Type: Plumier, Mss. 5: t. 35.

Plants large and coarse to 1.5 m. tall. Leaf blades oblong or ovate-oblong, 30-50 cm. long, 8-15 cm. wide, pale beneath, apex short-acuminate, base acute to rounded, somewhat inequilateral. Spikes ellipsoidal or oval, 5-10 cm. long, the peduncles pilose; bracts spiral, ovate, 1.5-3.5 cm. long, green, glabrous or appressed-pubescent; sepals lanceolate, obtuse, 8 mm. long; corolla white, tube 2.5 cm. long. Capsule 8 mm. long.

GENERAL DISTRIBUTION: Mexico, Central America, Jamaica, Hispaniola, South America.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe!, Dominica, Martinique!, St. Vincent.

COMMON NAME: Topitambou.

***Calathea lutea* (Aubl.) Meyer ex Koernicke in Bull. Soc. Nat. Moscow 35: 114. 1862.**

Basionym: *Maranta lutea* Aublet, Pl. Guian. 1: 4. 1775.

Type: Plumier, Mss. 5: t. 21, 22.

Syn.: *Calathea discolor* Meyer, Prim. Fl. Esseq. 7. 1818. Griseb., Fl. Br. W. Ind. Isl. 604. 1864; Duss, Fl. Phan. Ant. Fr. 584. 1897.

Stout herb 2-3 m. tall. Leaf blades elliptic to broadly oval, 35-150 cm. long, 24-60 cm. wide, apex obtuse or apiculate, base rounded or slightly



FIGURE 120. Marantaceae. *Calathea lutea*, $\times 0.1$.

acute, pruinose beneath. Spikes 8-16 cm. long; bracts 8-12, distichous, broadly obovate, 3.5-5.0 cm. broad, dark red or purple, glabrous or appressed-pilose; sepals linear, 1 cm. long; corolla lobes elliptic. Capsule 1-seeded.

GENERAL DISTRIBUTION: Central America, Jamaica, Puerto Rico, Trinidad.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe!, Dominica!, Martinique!.

COMMON NAME: Cachibou.

Calathea martinicensis Urban in Fedde Rep. Sp. Nov. 15: 103. 1917.

Type: Martinique, *Duss 2122* (n.v.).

Stem short to 5 cm. long. Leaves basal, petioles 20-23 cm.; blades obovate, 32 cm. long, 14 cm. wide, apex rounded and shortly obtusely acuminate, base cuneate, glabrous except for nerve below. Peduncle 6 cm. long; spike ovate, 15 cm. long, 9 cm. wide; bracts spiral, ovate, 4-5 cm. long, 3.0-3.5 cm. wide; sepals oblong-linear; corolla yellow; ovary glabrous.

GENERAL DISTRIBUTION: Known only from the island of Martinique.

DISTRIBUTION IN LESSER ANTILLES: Known only from the type collection *Duss 2122*, made at Camp Balata near St. Joseph and Bois de Loraine, Martinique; the specimen has not been located.

SPECIES IN CULTIVATION

Calathea zebrina (Sims) Lindl. (*Maranta zebrina* Sims) was reported as cultivated in the French islands in 1897 by Duss. Fournet (Fl. Guadeloupe Martinique 266. 1978) also reported this species as an ornamental as well as *C. ornata* (Lindl.) Koernicke.

ISCHNOSIPHON Koernicke

Ischnosiphon Koernicke in Nouv. Mem. Soc. Nat. Moscow 11: 316. 1859.

FIGURE 121.

Perennial herbs with scapose stems terminated by clusters of large leaves. Leaves with broadly winged sheaths, terete, short petioles and broad blades. Inflorescences axillary, consisting of few to many bracteate spikes; bracts spiral or distichous, appressed. Flowers paired, with 2 to many pairs in each bract; sepals 3, free, equal, linear; corolla united at base into a long tube, lobes lanceolate to oblong-lanceolate; staminal tube short, outer staminode petaloid, the single anther borne on short appendage; ovary 1-celled. Fruit capsular, 1-seeded, dehiscent; seed elongate, arillate.

TYPE SPECIES: *Ischnosiphon leucophaeus* (Poepp. & Endl.) Koernicke, based on *Calathea leucophaea* Poepp. & Endl.

A tropical genus of about 35 species occurring in the Americas and West Indies. For further discussion, see L. Andersson, The genus *Ischnosiphon* (Marantaceae), in Opera Bot. 43: 3-113. 1977.

KEY TO THE SPECIES

1. Leaves green on lower surfaces; spathes spiral; staminode purplish; capsule wall rigid. *I. arouma*
- 1a. Leaves glaucous on lower surfaces; spathes distichous at base; staminode yellow; capsule wall papery. *I. obliqua*

Ischnosiphon arouma (Aubl.) Koernicke in Bull. Soc. Nat. Moscow 35: 88. 1862.

Basionym: *Maranta arouma* Aublet, Pl. Guian. 1: 3. 1775.

Type: Plumier Mss. 5: t. 23, 24.

Syn.: *Maranta juncea* Lam., Encycl. Méth. Bot. 2: 589. 1788, illeg.

Tall herbs to 4 m., rhizomatous. Leaves with petioles terete for 10 cm. between ligule and pulvinus, articulation to 2.5 cm. long; blades ovate-oblong to lanceolate, 20-40 cm. long, 12-17 cm. wide, apex rounded or short-acuminate, base eccentrically acuminate, lower surface smooth and green. Inflorescences paniculate, with 4 or 5 branches; branches spicate, to 40 cm. long, the spathes more or less spiral, the spikes 0.4-0.6 cm. in diameter. Flower pairs 1, rarely 2; bracts 3.5 cm. long; sepals narrowly linear, 2.5 cm. long, red; corolla tube 2.7 cm. long, lobes 1.5 cm. long, yellow with red at apex; staminodia purplish. Capsule rigid.

GENERAL DISTRIBUTION: Lesser Antilles, Trinidad, South America.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe!, Dominica!, St. Vincent, Grenada!.

COMMON NAMES: Arouma, l'arouma.

Ischnosiphon obliqua (Rudge) Koernicke in Bull. Soc. Nat. Moscow 35: 88. 1862.

Basionym: *Maranta obliqua* Rudge, Pl. Guian. 1: 8, t. 2. 1805.

Type locality: Guiana.

Erect, robust plant to 3 m. tall. Leaves with petioles 10 cm. long or longer, upper pulvinus 5 cm. long; blades elliptic, 25-40 cm. long, 12-18 cm. broad, apex short-acuminate, base asymmetric, rounded to acuminate. Inflorescence racemose, up to 30 cm. long, 0.6-1.2 cm. thick; bracts distichous, up to 4.5 cm. long. Flower pairs 20 or more; sepals linear-lanceolate, 2 cm. long; corolla tube to 3.5 cm.; staminodia yellow. Capsule cylindrical, papery.

GENERAL DISTRIBUTION: Lesser Antilles, South America.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe!, Martinique!.

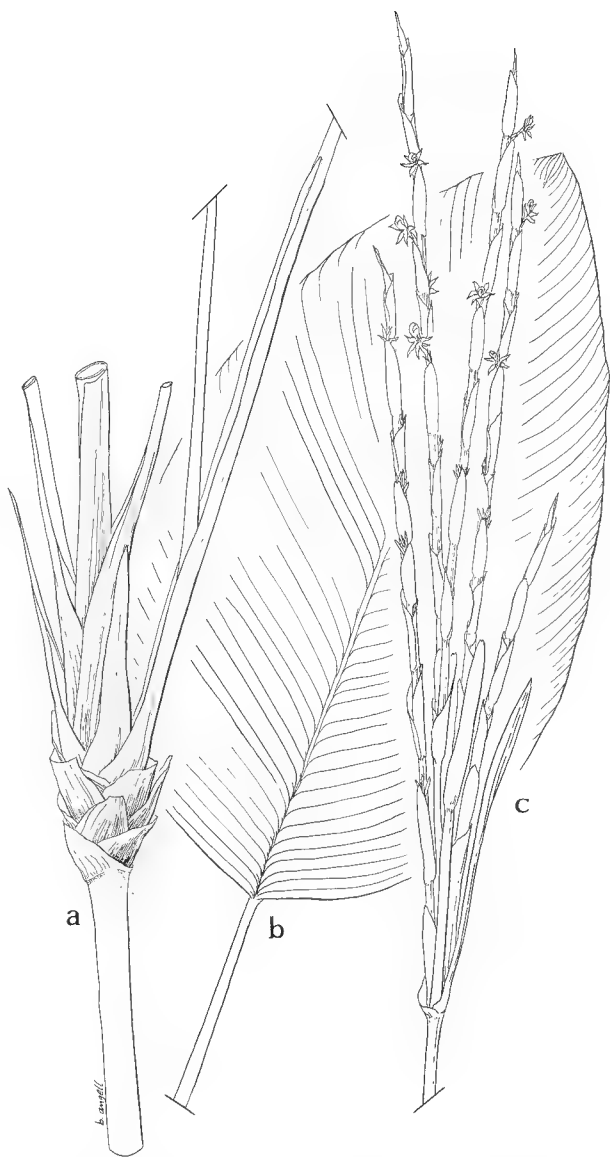


FIGURE 121. Marantaceae. a-c, *Ischnosiphon arouma*: a, cluster of leaf petioles on scapose stem, $\times 0.3$; b, leaf blade, $\times 0.2$; c, inflorescence, $\times 0.3$.

OBSERVATION: The several collections of Belanger, Hahn, Duss and Ques-
tel may all be of cultivated plants.

MARANTA Linnaeus

Maranta L., Sp. Pl. 1: 2. 1753.

FIGURE 122.

Perennial herbs. Leaves basal and distichous, cauline, the petioles sheathing at the base, the blades thin. Inflorescences racemose or paniculate; bracts clasping but caducous. Flowers in pairs, long-peduncled from the bracts, the terminal one long-pedicelled, the lower one sessile or short-pedicelled; sepals 3, equal; corolla tubular and usually enlarged or gibbose at the base, the 3 lobes subequal and somewhat hooded at the apex; two exterior staminodes petallike, obovate, showy, the anther free from petaloid filament; ovary 1-celled, with 1 ovule, the style incurved, the stigma lobed. Fruit nutlike, coriaceous; seed 3-angled, transversely and longitudinally ridged, arillate.

TYPE SPECIES: *Maranta arundinacea* L.

A genus of 23 species occurring in tropical America.

Maranta arundinacea L., Sp. Pl. 1: 2. 1753.

Type: Not designated.

Syn.: *Maranta indica* Tuss., Fl. Ant. 1: 183, t. 26. 1808. (Type locality: Jamaica.)

Perennial herb commonly cultivated or escaped, 0.5-1.5 m. tall; rhizomes scaly, tuberous; stems branched. Leaf sheaths elongate, broadly winged; petioles absent or terete to 15 cm. long between sheath and pulvinus; blades ovate-lanceolate to ovate-oblong, 10-30 cm. long, 3-10 cm. wide, apex acuminate, base rounded or truncate. Inflorescence much-branched; bracts linear, 3-5 cm. long. Flowers paired; sepals lanceolate, 10-15 mm. long; corolla white, the tube 1.0-1.5 cm. long, the lobes 8-10 mm. long; outer staminodia obovate, emarginate, the inner one shorter; ovary glabrous or pubescent on the ridges. Capsule 1 cm. long; seeds 8-9 mm. long, transversely ridged, pale red, with yellow aril.

GENERAL DISTRIBUTION: Probably native to South America and cultivated or escaped in Central America, the Greater Antilles and South America.

DISTRIBUTION IN LESSER ANTILLES: St. Martin, St. Barts!, Antigua, Saba!, St. Eustatius, Montserrat!, Guadeloupe!, Dominica!, Martinique!, St. Vincent!, Grenada!.

COMMON NAMES: Arrowroot, ararut, l'envers caraibe, l'envers blanc.

OBSERVATIONS: The ground and washed rhizome of the species is the source of the starch arrowroot. The cultivar 'Variegata' is reported to be under cultivation as an ornamental on St. Martin and Saba.



FIGURE 122. Marantaceae. *Maranta arundinacea*, $\times 0.3$.

SPECIES IN CULTIVATION

Maranta gibba J. E. Smith in Rees, Cyclop. 22, *Maranta* no. 2. 1812, was reported by Grisebach (Fl. Br. W. Ind. Isl. 605. 1864) from Antigua as represented by a Wulschlaegel collection (n.v.). The species was described from material cultivated in Liverpool, sent by Lord Seaforth from Barbados but probably obtained elsewhere.

Maranta ruiziana Koern. was once cultivated on Guadeloupe and Martinique and is represented by the collections *Duss* 4196 (NY!) and 4472 (NY!), respectively.

Neither species has been reported or collected subsequently.

BURMANNIACEAE

by Hanneue C. M. Snelders and Paul J. M. Maas⁸

BURMANNIACEAE Blume, Enum. Pl. Java 1: 27. 1827.

Erect, saprophytic herbs. Leaves alternate, small and scalelike, stem-clasping. Inflorescence a double cincinnus or plants having a solitary, terminal flower only. Flowers hermaphroditic, actinomorphic, tubular at the base. Tepals six, the three inner ones smaller than the outer ones. Stamens three, inserted below the inner tepals. Style 3-branched at the apex, each branch with a horseshoe-shaped stigma; stigmas sometimes appendiculate. Ovary inferior, unilocular, with three parietal placentae, sometimes with two globose glands at the apex of the placentae. Fruit a longitudinally or apically dehiscent capsule crowned by the persistent or partly deciduous floral tube. Seeds many, very small, narrowly to broadly ellipsoid.

TYPE GENUS: *Burmannia* L.

About 100 species in 17 genera, mainly restricted to the tropics. In the Lesser Antilles the family is represented only by the subtribe Apterieae.

KEY TO THE GENERA

1. Flowers white; outer tepals 3-lobed; upper part of floral tube quickly deciduous; placentae each with two apical, globose glands.1. *Gymnosiphon*
- 1a. Flowers purplish-white; outer tepals entire; floral tube completely persistent, even in fruit; placentae without glands. 2. *Apteria*

GYMNOSIPHON Blume

Gymnosiphon Blume, Enum. Pl. Java 1: 29. 1827.

Saprophytic herbs. Rootstock densely covered with narrowly ovate, imbricate scales, base stem-clasping, apex acute to acuminate. Inflorescence

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a terminal, double cincinnus, each cincinnus 1- to 10-flowered, the base of the inflorescence with two stem-clasping bracts. Flowers white, erect, salver-shaped, pedicellate; outer tepals 3-lobed; inner tepals very small, inserted in the floral tube below the insertion of the outer tepals. Stamens sessile, connective without appendages, thecae dehiscing horizontally, attached medially. Stigma mostly with long, filiform appendages. Each placenta with two globose, apical glands. Upper part of the floral tube quickly deciduous.

TYPE SPECIES: *Gymnosiphon aphyllus* Blume.

A genus of about 20 species, with 12 species located in the neotropics, seven in tropical Asia, and three in tropical Africa.

KEY TO THE SPECIES

1. Capsule very broadly obovoid to broadly obovoid, 2.5-4.2 mm. long including the persistent part of the floral tube; pedicels 0.3-1.5 mm. long. 1. *G. sphaerocarpus*
- 1a. Capsule broadly obovoid to ellipsoid or globose, 3.0-5.5 mm. long including the persistent part of the floral tube; pedicels 0.5-5.0 mm. long. 2. *G. niveus*

1. ***Gymnosiphon sphaerocarpus*** Urban, Symb. Antill. 3: 442. 1903; Jonker, Monogr. Burm. 180. 1938; Hodge in Lloydia 17: 182. 1954.

Type: Guadeloupe. *L'Herminier s.n.*! (holotype, B; isotype, G).

Syn.: *Ptychomeria sphaerocarpa* (Urban) Schlechter in Fedde Rep. Sp. Nov. 17: 257. 1921; Stehlé in Bull. Soc. Bot. France 85: 513. 1938, Fl. Descr. Ant. Fr. 1: 273, f. 32. 1939.

Herbs 6-16 cm. tall. Rootstock with scales 1.7-2.0 mm. long. Stems white, branched, sometimes simple. Leaves ovate, 0.8-2.1 mm. long, apex acute. Inflorescence a double cincinnus, each cincinnus 0.5-9.0 cm. long, 2- to 10-flowered, sometimes twice-branched. Bracts ovate, 0.6-1.5 mm. long, apex acute. Pedicels white, 0.3-1.5(-2.8) mm. long. Flowers white, pale yellow in bud, 3.2-5.0 mm. long; floral tube 3.2-3.5 mm. long; outer tepals 0.7-1.5 mm. long, 3-lobed, the central lobe ovate with apex obtuse, the lateral lobes ovate to lanceolate; inner tepals narrowly obovate, very small. Connective broadly obovoid, base rounded, apex acute. Style including branches and stigma 1.4-1.8 mm. long, branches almost absent; ovary obconical to broadly obconical, 0.7-1.5 mm. long. Capsule grey, striped, broadly to very broadly obovoid, up to 2.8 mm. long (including the persistent, somewhat constricted part of the floral tube (1.7-)2.3-4.2 mm. long), up to 2.0 mm. in diameter. Seeds brown, ellipsoid, 0.15-0.30 mm. long.

GENERAL DISTRIBUTION: Greater and Lesser Antilles; in forests.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe!, Dominica!.

This species' floral characters are still very poorly known. It is closely related to *G. niveus*.

2. **Gymnosiphon niveus** (Griseb.) Urban, Symb. Antill. 3: 444. 1903; Jonker, Monogr. Burm. 193. 1938.

Basionym: *Ptychomeria nivea* Griseb., Cat. Pl. Cub. 257. 1866.

Type: Cuba, Oriente, Valparaiso. Wright 3285! (holotype, GOET; isotypes, BM, G, GH, MO, NY, S).

Syn.: *Gymnosiphon germaini* Urban, Symb. Antill. 3: 444. 1903; Jonker, Monogr. Burm. 194. 1938; Hodge in Lloydia 17: 182. 1954.

Ptychomeria germaini (Urban) Stehlé in Bull. Soc. Bot. France 85: 514. 1938, Fl. Descr. Ant. Fr. 1: 276, f. 32. 1939. (Type: Guadeloupe. *Germain s.n.*! (holotype, B; isotype, G).)

Gymnosiphon parviflorus Urban, Symb. Antill. 3: 443. 1903.

Ptychomeria parviflora (Urban) Schlechter in Fedde Rep. Sp. Nov. 17: 257. 1921. (Type: Cuba, Oriente, Monteverde. Wright s.n. (holotype, B!).)

Gymnosiphon portoricensis Urban, Symb. Antill. 3: 445. 1903.

Ptychomeria portoricensis (Urban) Schlechter in Fedde Rep. Sp. Nov. 17: 257. 1921. (Type: Puerto Rico, Humacao, Guajabota, near Jabucoa. *Sintenis 5170!* (holotype, B; isotypes, G, GH, GOET, K, P, S, U).)

Gymnosiphon fawcettii Urban, Symb. Antill. 5: 294. 1907; Jonker, Monogr. Burm. 195. 1938.

Ptychomeria fawcettii (Urban) Schlechter in Fedde Rep. Sp. Nov. 17: 257. 1921. (Type: Jamaica, Troy. Harris 9494! (holotype, B; isotype, NY).)

Herbs 4-28 cm. high. Rootstock with scales 0.6-2.5 mm. long. Stems white, simple or branched. Leaves ovate, 0.7-2.0 mm. long, with apex acute or obtuse. Inflorescence a double cincinnus, each cincinnus 0.3-6.0 cm. long, 1- to 9-flowered. Bracts narrowly ovate to ovate, 0.8-2.0 mm. long, apex acute. Pedicels (0.5-1.0-4.5(-5.0) mm. long. Flowers white, 5.0-7.0 mm. long; floral tube 2.5-4.7 mm. long; outer tepals 1.5-2.0 mm. long, ca. 1.0 mm. wide, 3-lobed, the central lobe ovate, 1.0-1.1 mm. long, 0.8-1.0 mm. wide, with apex acute, the lateral lobes narrowly ovate to ovate, 0.5 mm. long, 0.2 mm. wide, with apex acute; inner tepals obovate to broadly obovate, 0.13-0.25 mm. long, 0.13-0.20 mm. wide, often swollen, with apex obtuse. Stamens inserted 0.5 mm. below the insertion of the inner tepals, connective broadly obovoid, base rounded, apex truncate. Style including branches and stigmas 1.5-2.6 mm. long (without branches and stigmas 1.8-2.0 mm. long), branches 0.15-0.20 mm. long, stigmas with filiform appendages. Ovary obconical, 1.3-2.1 mm. long. Capsule grey, striped, broadly ellipsoid, up to 3.7 mm. long (including the persistent part of the floral tube 3.0-5.5 mm. long), up to 2.2 mm. in diameter. Seeds brownish-yellow to yellowish-white, irregularly and broadly ellipsoid, 0.20-0.25(-0.45) mm. long.

GENERAL DISTRIBUTION: Greater and Lesser Antilles.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe!, Dominica!, St. Vincent!.

The floral structure of this species is also not well known. Additional preserved material is necessary for adequate study of the flowers.

APTERIA Nuttall

Apteria Nuttall in Jour. Acad. Nat. Sci. 7: 64. 1834.

Saprophytic herbs. Stems with one terminal or several axillary flower(s). Flowers purplish to purplish-white, erect or nodding, funnel- to salver-shaped. Inner tepals somewhat smaller than the outer ones. Stamens inserted below the inner tepals on a crescent-shaped outgrowth of the floral tube; each filament abaxially bearing a two-lobed wing; connective with two lateral stalks; thecae dehiscing transversally. Placentae lacking glands. Floral tube completely persistent in fruit.

TYPE SPECIES: *Apteria aphylla* (Nuttall) Barnh. ex Small.

A monotypic genus, the single, polymorphic species widespread throughout the neotropics.

1. **Apteria aphylla** (Nuttall) Barnh. ex Small, Fl. S. E. U.S. 309. 1903; Jonker, Monogr. Burm. 205. 1938.

Basionym: *Lobelia aphylla* Nuttall in Am. Jour. Sci. Arts 5: 297. 1822.

Type: U.S.A., E. Florida, Ware s.n. (holotype, BM!).

Syn.: *Apteria setacea* Nuttall in Jour. Acad. Nat. Sci. 7: 64, pl. 19, f. 2. 1834; Griseb., Fl. Br. W. Ind. Isl. 606. 1864. (An illegitimate renaming of *Lobelia aphylla* Nutt.)

Apteria hymenanthera Miquel, Stirp. Surinam. 216. 1850; Urban, Symb. Antill. 3: 448. 1903; Stehlé, Fl. Descr. Ant. Fr. 1: 277, f. 33. 1939.

Apteria aphylla (Nutt.) Barnh. ex Small var. *hymenanthera* (Miquel) Jonker in Pulle, Fl. Suriname 1: 186. 1938; Jonker, Monogr. Burm. 208. 1938. (Type: Surinam, Hostmann 959! (holotype, U; isotypes, BM, DS, G, GH, K, OXF, P, W).)

Herbs 5–25 cm. high. Stems simple or branched, purplish, the lower part yellowish-white. Leaves purplish to white, narrowly ovate to ovate, 0.5–3.5 mm. long, apex acute. Stems 1- to few-flowered; pedicels up to 20 mm. long. Flowers purplish to purplish-white, 6.0–15.0 mm. long. Floral tube 4.0–6.0 mm. long; outer tepals ovate to angular-ovate, 1.2–5.3 mm. long, (1.6–)1.9–4.0 mm. wide, apex acute; inner tepals narrowly ovate to narrowly oblong, 1.2–5.3 mm. long, 0.4–1.2 mm. wide, apex obtuse. Stamens yellow, inserted 2.0–4.5 mm. below the insertion of the inner tepals; filament 0.5–1.0 mm. long, the abaxial side with a two-lobed wing, the lobes elliptic to obovate, 0.8–1.5 mm. long, 0.6–1.2 mm. wide, base shortly attenuate, apex rounded; base of the filament implanted in the middle of a crescent-shaped outgrowth of the floral tube, 1.8–2.4 mm. long, 0.3–0.5 mm. wide; connective broadly ovoid, with two lateral stalks 0.4–0.5 mm. long, the base of the connective bearing medially a very broadly ovate to very broadly obovate appendage 0.2–0.3 mm. long. Style 2.4–4.5 mm. long including branches and stigmas. Ovary creamy, obovoid to angular-ovoid, narrowed toward the apex into the style, 1.7–2.9(–3.7) mm. long. Capsule creamy, broadly ellipsoid to

globose, 2.6-4.2 mm. long, 1.7-3.5(-5.0) mm. in diameter, crowned by the persistent floral tube. Seeds brown to yellowish-brown, ellipsoid to narrowly ellipsoid, 0.30-0.38(-0.60) mm. long.

GENERAL DISTRIBUTION: Throughout the neotropics.

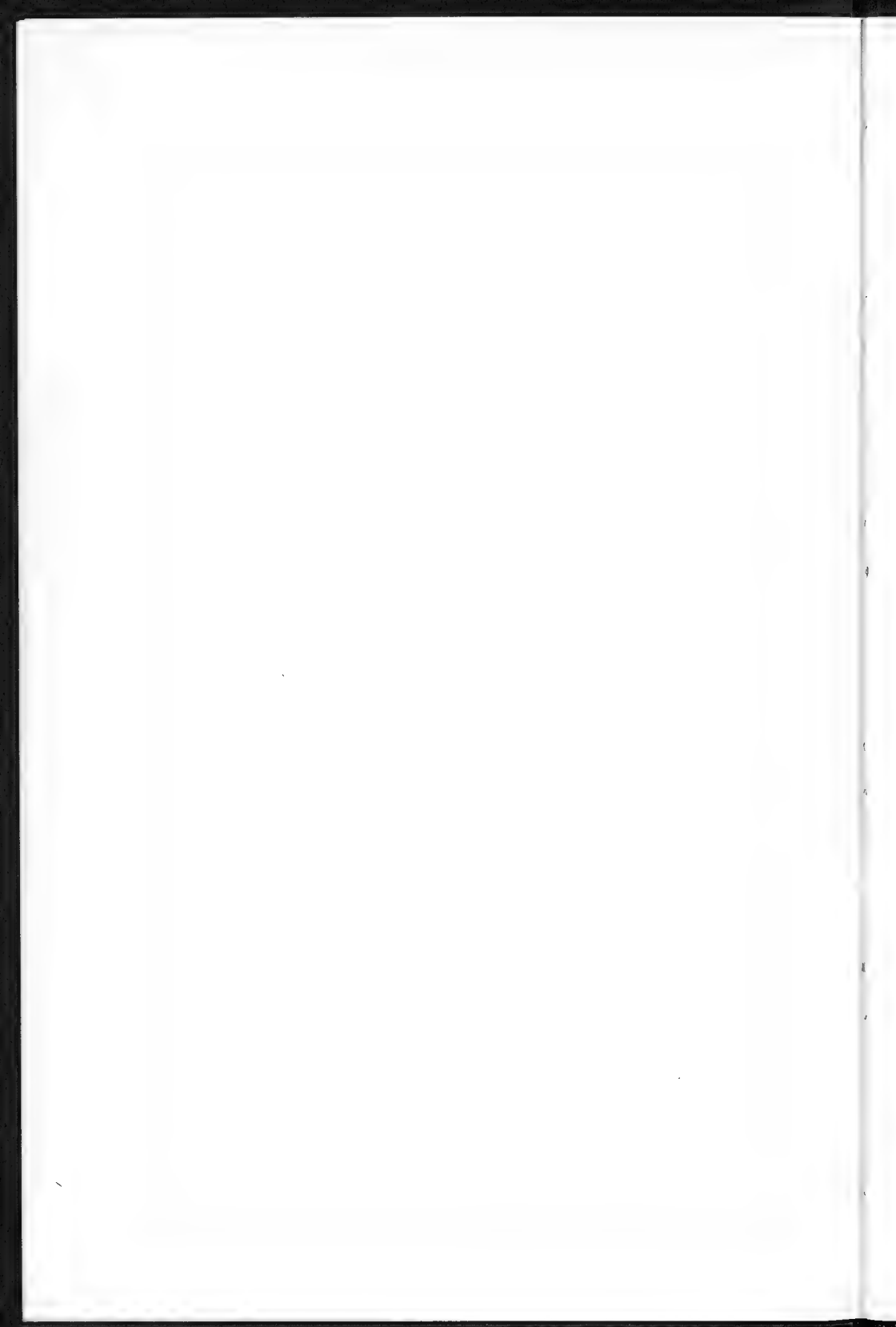
DISTRIBUTION IN LESSER ANTILLES: St. Kitts!, Montserrat!, Guadeloupe!, Martinique!.

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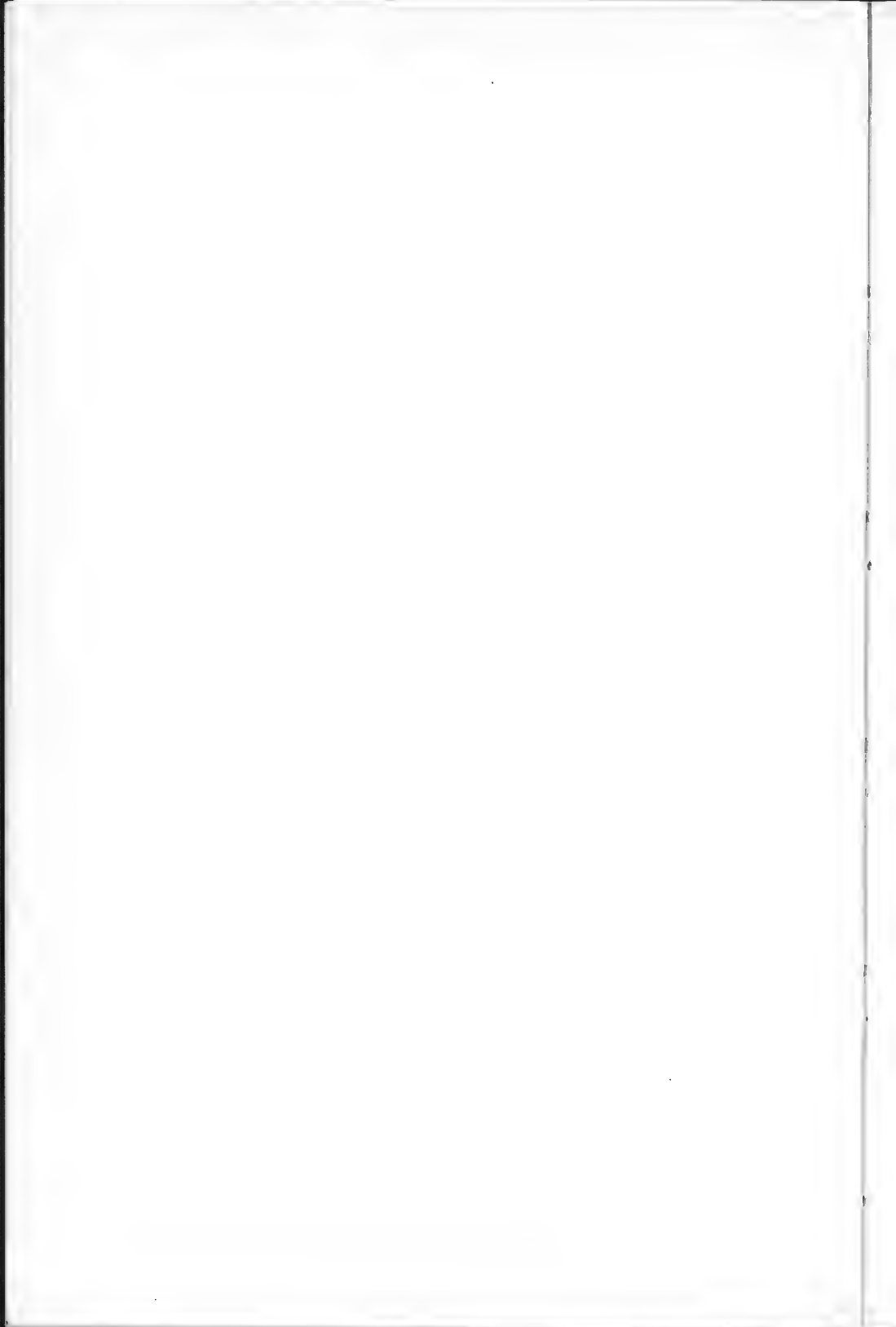
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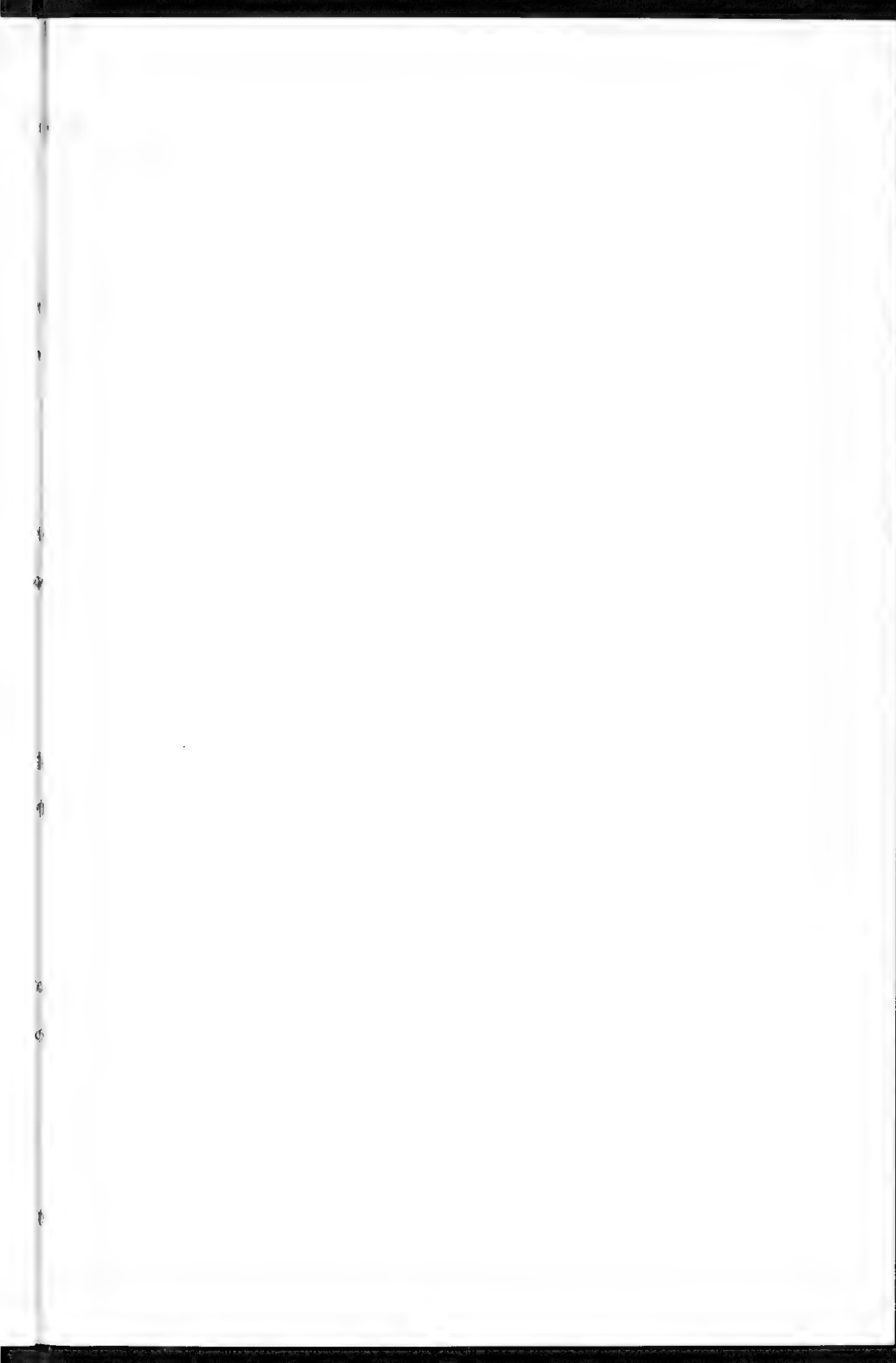
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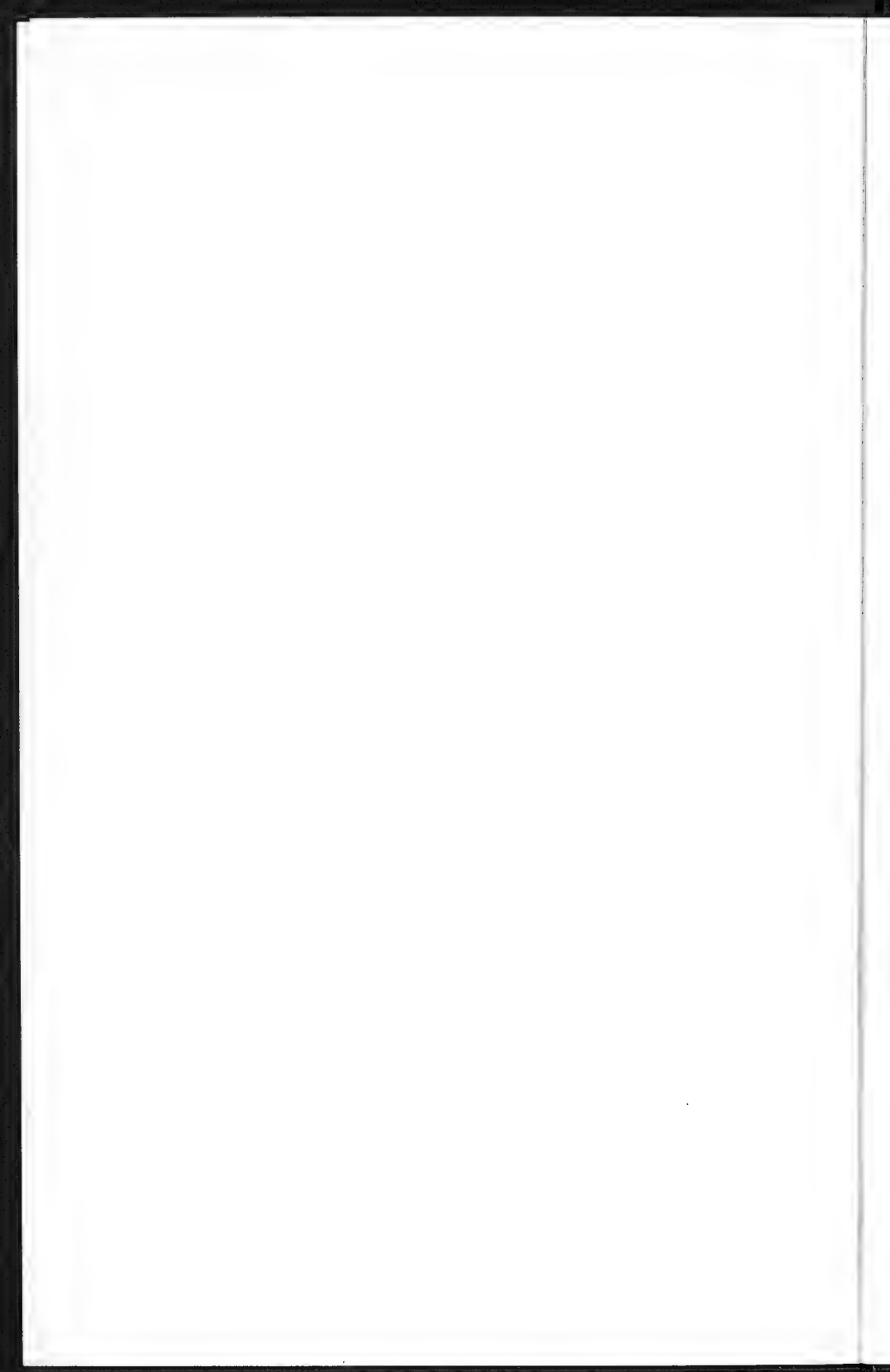
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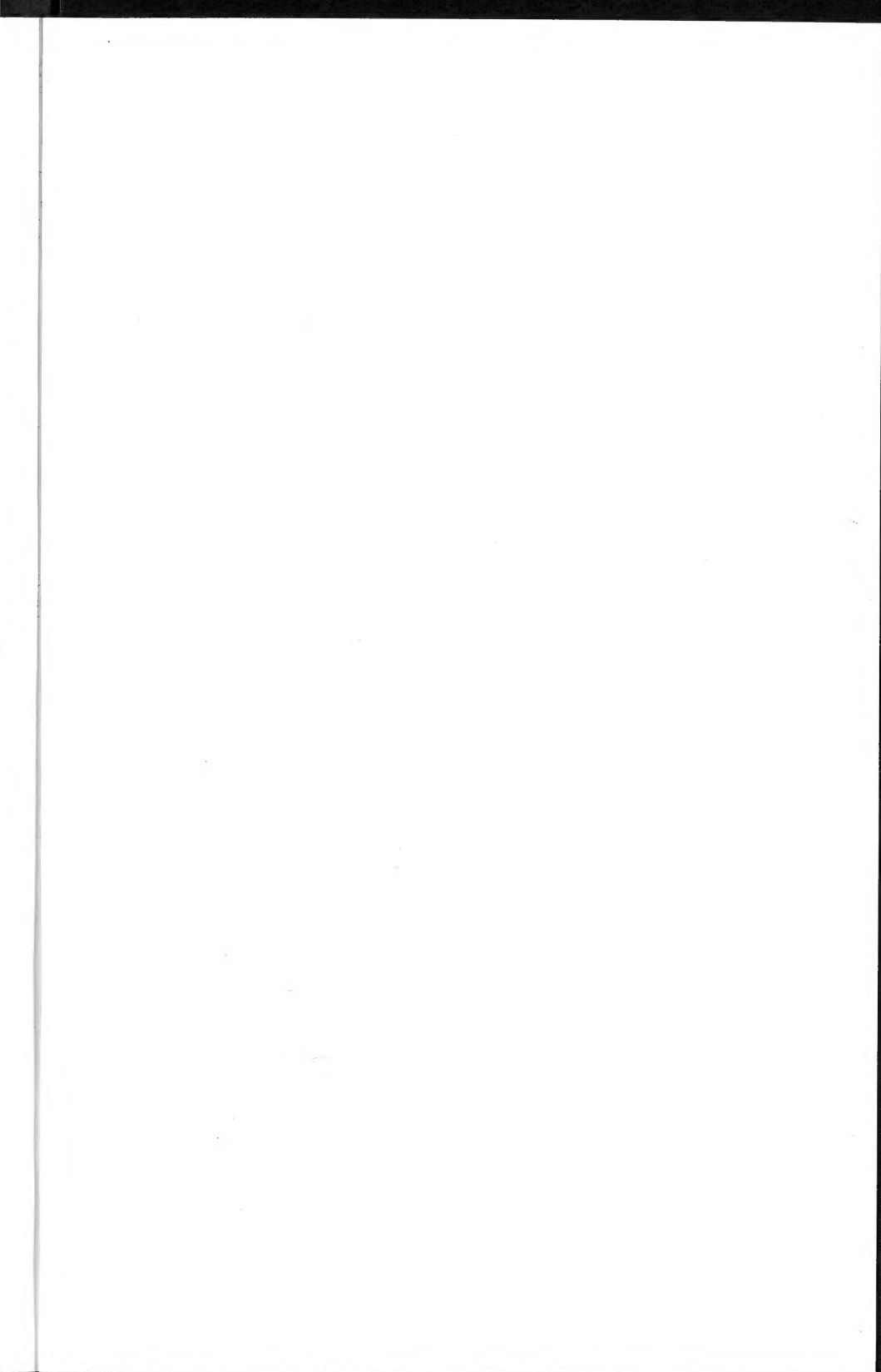
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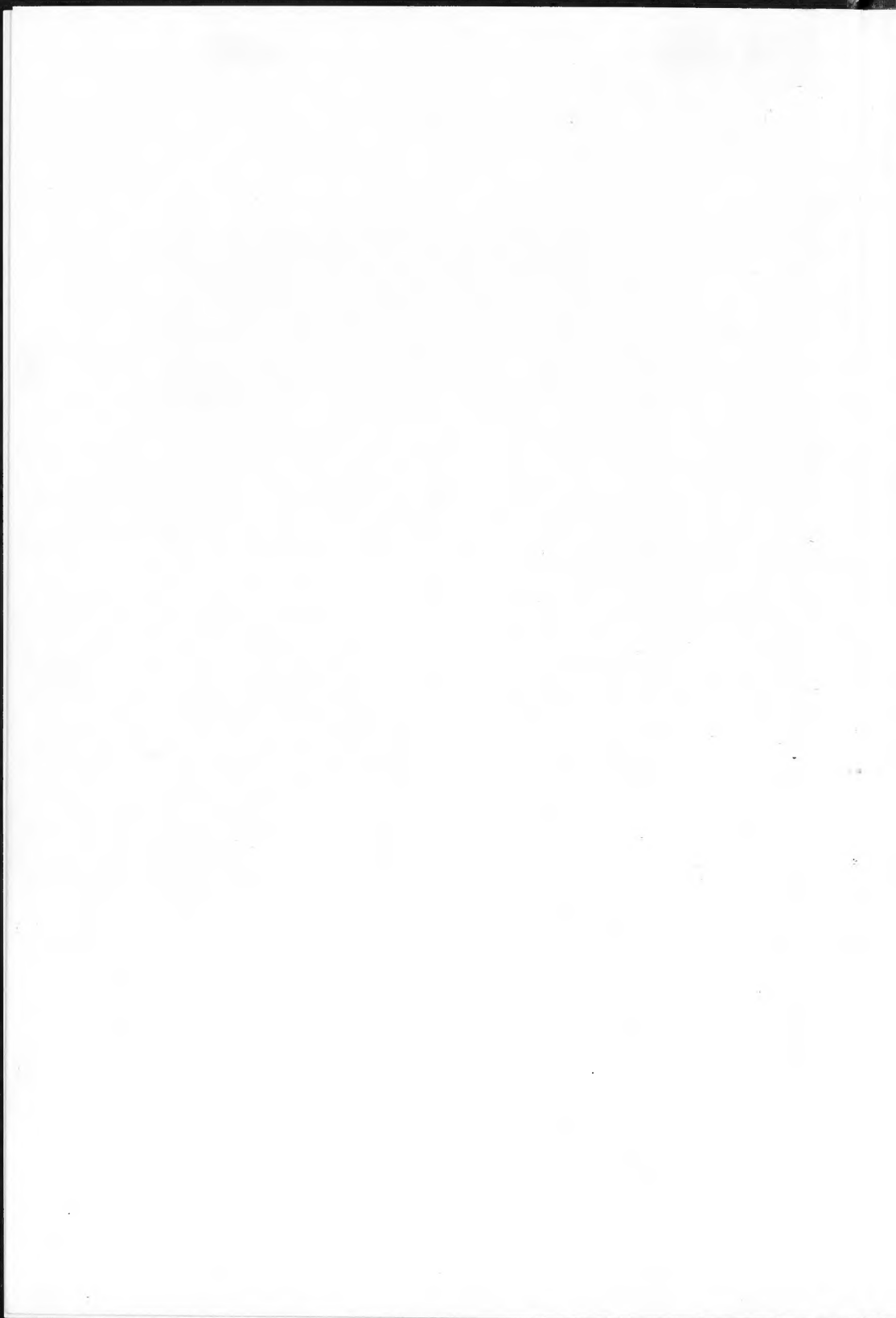
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